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# USSR Report

CONSTRUCTION AND RELATED INDUSTRIES

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10 May 1985

## USSR REPORT

### CONSTRUCTION AND RELATED INDUSTRIES

#### CONTENTS

##### CONSTRUCTION PLANNING AND ECONOMICS

Economic Experiment Includes Greater Local Authority (EKONOMICHESKAYA GAZETA, No 3, Jan 85).....	1
Long Distance Hauling of Materials Too Costly (A. Galaburda; EKONOMICHESKAYA GAZETA, No 4, Jan 85).....	9
Excessive Overhead in Ukrainian Construction Ministry (N. Shklyaruk; EKONOMICHESKAYA GAZETA, No 4, Jan 85).....	11

##### INDUSTRIAL CONSTRUCTION

Plan Fulfillment for Moscow Construction Reviewed (MOSKOVSKAYA PRAVDA, 20 Feb 85).....	13
Payback From Modernization of Industrial Plants Viewed (B. S. Bushuyev, A. A. Alibekov; PROMYSHLENNOYE STROITEL'- STVO, No 12, Dec 84).....	16
Modernization of Concrete Production Plants Viewed (L. I. Nodel'; PROMYSHLENNOYE STROITEL'STVO, No 1, Jan 85).	23
Remedies for Lags in Capital Construction Viewed (A. Lupar'; EKONOMICHESKIYE NAUKI, No 10, Oct 84).....	27
Wall Panel Output in Estonia To Increase (SOVETSKAYA ESTONIYA, 27 Nov 84).....	37
Update on Construction of Oil Field Support Facilities (SOVETSKAYA ESTONIYA, 29 Nov 84).....	38

## AGRICULTURAL CONSTRUCTION

- Book on Rural Construction Management Problems Reviewed  
(S. S. Kovalenko, A. G. Yermichev; EKONOMIKA STROITEL'-  
STVA, No 9, Sep 84)..... 39

## HOUSING CONSTRUCTION

- Builders Held Responsible for Low-Quality Housing  
(Georgiy Arkad'yevich Karavayev; SOTSIALISTICHESKAYA  
INDUSTRIYA, 3 Nov 84)..... 43

## CONSTRUCTION MACHINERY AND EQUIPMENT

- Ministry Official on New Technology in Far East Construction  
(Yu. Drobyazgo; PLANOVoye Khozyaystvo, No 2, Feb 85)..... 47
- Quality Problems With Cement, Concrete Noted  
(I. Karagod; EKONOMICHESKAYA GAZETA, No 2, Jan 85)..... 60
- Quake Resistant, Large Panel Houses Under Development  
(R. Ismaylov; PRAVDA VOSTOKA, 8 Jan 85)..... 63
- Non-Destructive Testing of Steel Structures Developed  
(M. Belostotskaya; VECHERNAYA MOSKVA, 22 Dec 84)..... 65
- Artillery Used for Foundation Work in Winter  
(A. Gil'ts; KRASNAYA ZVEZDA, 20 Jan 85)..... 66



CONSTRUCTION PLANNING AND ECONOMICS

ECONOMIC EXPERIMENT INCLUDES GREATER LOCAL AUTHORITY

Moscow EKONOMICHESKAYA GAZETA in Russian No 3, Jan 85 p 17-18

[Article: "Experiment in Construction"]

[Text] A statute on the experimental implementation of construction of a series of facilities according to plans and estimates coordinated between the customer and the contractor and submitted "under key", on the expansion of independence of building organizations and on increasing the responsibility of the building participants.

Ratified by the USSR Gosplan [State Planning Committee], USSR Gosstroy [State Committee for Construction Affairs], USSR Goskomtrud [State Committee for Labor and Social Problems], USSR Minfin [Ministry of Finance] and USSR Stroybank [Bank for Financing Capital Investments] on 12 November 1984.

1. This Statute has been developed in accordance with the resolution of the CPSU Central Committee and the USSR Council of Ministers dated 29 April 1984, No 387 "On Improving Planning, Organization and Management of Capital Construction" for the experimental implementation of construction of a number of industrial facilities, residential houses and facilities of social-domestic function according to plans and estimates coordinated between the customer and the contractor with the facilities being submitted "under key" and ready for production output.\* It provides for expansion of independence and increased responsibility of the building organizations, as well as increased responsibility on the part of the customers, planning organizations, and manufacturers and suppliers of materials and equipment participating in the construction at all stages of the investment process, starting with the development of project-estimate documentation to the operational submission of the facilities.

2. The purpose of performing the experiment is the development of a system of measures under production conditions which would ensure the construction of

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\* Henceforth, "implementation of the experimental construction of a series of production facilities, residential houses and facilities of social-domestic function according to plans and estimates coordinated between the customer and the contractor with "under key" submission of the facilities ready for production output" will be referred to as "the experiment".

production capacities and facilities within standard times, the further reduction in building time for the facilities, the provision of stability of the estimated cost of construction, the increased effectiveness of building production based on the accelerated growth rate of labor production, the economical expenditure of material-technical resources, the accelerated introduction of scientific-technical achievements, and the intensification of production.

The experiment is being conducted starting in 1985 in the construction organizations of the USSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises] Glavsreduralstroy [Construction in the Central Urals Main Administration], the USSR Minpromstroy [Ministry of Industrial Construction] Glavsrednevolzhskstroy [Construction in the Central Volga Region Main Administration], the USSR Minstroy [Ministry of Construction] Glavzapstroy [Construction in Western Regions Main Administration], the BSSR Minpromstroy and the BSSR Minsel'sstroy [Ministry of Rural Construction].\*\*

3. This Statute defines the basic questions associated with conducting the experiment and providing for: improvement in the mutual relations between the organizations participating in construction, starting with development of the project-estimate documentation and up to submission of the facilities for operation; development of planning of production-management activity of the glavks and ministries--experiment participants; development of cost accounting and economic stimulation, and improvement of material-technical provision for construction.

4. Overall coordination of work on conducting the experiment and resolving any methodological questions arising in connection with it is performed by an Interdepartmental Commission under the USSR Gosplan dealing with questions of conducting the experiment on construction of facilities and their submission "under key."

5. The USSR Mintyazhstroy, USSR Minpromstroy, USSR Minstroy, USSR Minsel'sstroy and the BSSR Council of Ministers:

develop and ratify methodological directives for implementation of the experiment in their subordinate glavks and ministries--experiment participants, and coordinate them with the USSR Gosplan Interdepartmental Commission on management of the experiment in construction;

provide guidance in the implementation of the experiment and render methodological and practical aid to the glavks and ministries participating in the experiment;

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\* Henceforth, the "USSR Mintyazhstroy Glavsreduralstroy, USSR Minpromstroy Glavsrednevolzhskstroy, USSR Minstroy Glavzapstroy, BSSR Minpromstroy and BSSR Minsel'sstroy" will be referred to as the "glavks [main administrations] and ministries--experiment participants".

submit annually prior to 1 April information on the results of implementation of the experiment to the USSR Gosplan Interdepartmental Commission on questions of conducting the experimental construction of facilities with their submission "under key."

6. Effective as of 1985, the following indicators, limits and economic standards are ratified in the plans for economic and social development of the glavks and ministries participating in the experiment (according to primary activity):

in the five-year plan:

operational introduction of production capacities and construction sites;

the overall volume of contract construction-installation work (with breakdown by customers) and the volume performed by the organization's own efforts (estimated);

the growth in labor productivity;

the marginal level of expenditures per 1 ruble of construction-installation work (estimated);

the limits of state capital investments and construction-installation work, operational introduction of fixed capital, production capacities and construction sites (according to the organization's own capital construction);

in the annual plans:

the operational introduction of production capacities and construction sites;

the volume of commodity building production;

the overall volume of contract construction-installation work (with breakdown by customers) and the volume performed by the organization's own efforts (estimated);

the growth in labor productivity;

the standard wage per ruble of volume of contract construction-installation work;

the profit from contract work;

the marginal level of expenditures per 1 ruble of construction-installation work (estimated);

the standard deduction from profits for all types of activity under the management of the glavk and ministry participating in the experiment.

the task for introduction of new technology and scientific organization of labor;

the volume of supply of materials, machines, mechanisms and other material-technical resources necessary for plan fulfillment;

the standard deductions for economic incentive funds;

the standard for formation of a unified fund for the development of science and technology.

Other indicators on the basic activity are established in the five-year and annual plans by the experiment participant-glavks and ministries themselves.

The list of indicators, limits and economic standards ratified in the five-year and annual plans for the construction-installation organizations and the subordinate glavks and ministries participating in the experiment is determined by the appropriate participant glavks and ministries.

By other types of activity, the experiment participant glavks and ministries retain the plan indicators which are in effect for the appropriate sectors.

7. The development of an outline for the five-year plan is done by the glavks and ministries participating in the experiment and by their subordinate construction-installation organizations on the basis of control figures and economic standards reported to them by the appropriate superior organs, as well as on the basis of customer proposals for the operational introduction of production capacities and construction facilities and for volumes of construction-installation work.

8. Upon ratification of volumes of contract construction-installation work in the five-year plan according to the plan year, the USSR Mintyazhstroy, USSR Minpromstroy, USSR Minstroy and USSR Minsel'sstroy provide a reserve in the capacity of the glavks and ministries participating in the experiment in the amount of up to 10 percent of the overall capacity of these organizations for purposes of utilizing this reserve for better balance coordination of the annual plan indicators.

9. The development of tasks on the operational introduction of production capacities and construction facilities in the annual plan outlines and the definition of volumes of commodity building production and contract construction-installation work is done by the glavks and ministries participating in the experiment and their subordinate construction-installation organizations on the basis of indicators provided for them for the appropriate year in the five-year plan, and with consideration of the course of construction, the title lists of carryover construction sites and the proposals of customers for new construction starts.

At the same time as the development of tasks for the operational introduction of production capacities and construction facilities for the plan year, the tasks for the next plan year are also developed, with breakdown by 6-month periods.

The customer enterprises and organizations present proposals to the construction-installation organizations, glavks and ministries participating in the experiment



(in accordance with forms established by the USSR Gosplan) for the operational introduction of production capacities and construction facilities for the plan year and the following years, and for volumes of commodity building production and contract construction-installation work at priority construction sites to 1 March and for all facilities as a whole to 1 April of the year preceding the plan year. The list of priority sites is coordinated with the USSR Gosplan.

Prior to 10 April of the year preceding the plan year, the glavks and ministries participating in the experiment present estimates of the capacity of the construction-installation organizations for the plan year to their appropriate superior union republic and USSR construction ministries, as well as proposals for further defining the volumes of contract construction-installation work specified in the five-year plan for the plan year (in accordance with the standard construction times) on the whole and by customers. This is done in cooperation with the local soviet organs.

Prior to 20 April of the year preceding the plan year, the USSR Mintyazhstroy, USSR Minpromstroy, USSR Ministroy and USSR Minsel'stroy ratify the capacities of the construction organizations of the glavks and ministries participating in the experiment for the plan year and, in coordination with the USSR Gosplan, define the volume of contract construction-installation work for the most important construction sites. The volumes of contract construction-installation work for other construction sites and facilities are determined by the glavks and ministries participating in the experiment in conjunction with the customers.

The annual plans for glavks and ministries participating in the experiment must be ratified by the appropriate ministries and forwarded to the executors no later than 1 November of the year preceding the plan year.

10. According to the conditions of the experiment, starting in 1985, as a rule, the construction of all new housing starts, production facilities and facilities of social-domestic function will be implemented according to the list of sites and facilities coordinated with the customers by the glavks and ministries--experiment participants.

In the implementation of construction with submission of the facilities "under key":

the general contractor bears responsibility for the timely completion of all types of construction-installation work and for realizing initial production at facilities of production function, as well as for the timely preparation for service or operational introduction (to full volume) of facilities of residential and social-domestic function;

the subcontracting organizations bear the responsibility for fulfillment of specialized work complexes and for the operational introduction of facilities on par with the general contractor;

the customer enterprises and organizations are responsible for the timely and complete provision of facilities under construction with equipment and for bringing the enterprises up to project capacity.

The facilities completed by the builders are submitted "under key" by the contractor in conjunction with the customer in accordance with the order established by the resolution of the USSR Council of Ministers dated 23 January 1981, No 105.

11. The development of the construction portion of working documentation for new construction sites of production function begun in 1986 is provided by the glavks and ministries participating in the experiment through the efforts of their subordinate planning and research organizations, or through their orders to planning and research organizations of other ministries and departments. (This is done with the customer transferring over the appropriate volumes of work of the planning and research organizations to the other organizations).

The estimated cost of construction-installation work defined in the plan (manufacturing plan) and ratified in the established order by the customer in accordance with the contractor is the final contractual price of the construction-installation work.

The contractual price of construction-installation work is used in determining the volumes of construction-installation work in the title lists of construction sites, in planning commodity building production and contract work, as well as in accounting between the customers and the glavks and ministries participating in the experiment.

If the contractual price of the construction-installation work is exceeded in the course of construction of the facilities, the additional expenditures are related to the production costs of the construction-installation work by the glavk or ministry participating in the experiment.

The savings realized in the construction of facilities as a result of reduction in cost as compared with the contractual price of construction-installation work is passed on to the appropriate construction-installation organizations. This savings is achieved as a result of effective planning and actual reduction in the production cost of construction-installation work.

The savings from planning is defined as the difference between the contractual price of construction-installation work and the estimated cost of this work defined in the estimates compiled according to the manufacturing plans.

At the discretion of the glavks and ministries participating in the experiment, the distribution of the savings realized from planning may be implemented in accordance with the Methodological Statutes on conducting the experiment, which provide for a reduction in the material and labor expenditures and a reduction in the estimated cost of construction as ratified by the USSR Gosplan Inter-departmental Commission on questions of the application of new methods of planning and economic stimulated, dated 15 July 1982 (Protocol No 386).

12. The general contract agreement for capital construction is concluded with the construction-installation organization--the general contractor, which is



subordinate to the glavks or ministries participating in the experiment--the customer, for the entire period of construction. (If the construction time exceeds one year, it specifies the tasks by year). No annual contract agreements are concluded. If necessary, additional agreements are concluded.

If the customer causes a delay in submitting the necessary documentation to the general contractor for conclusion of the general contract agreement, or if he fails to fulfill some other conditions causing a delay in the conclusion of this agreement in time prior to 1 January of the plan year, the general contractor has the right to decline the contract. In this case, new construction starts with estimated cost of up to 4 million rubles are excluded from the plan by the general contractor, while the question of building facilities with estimated cost of 4 million rubles or greater is examined by the customer-ministry and the appropriate construction ministry in order to determine the new times for starting construction and concluding the agreement. If necessary, the new construction times are coordinated with the USSR Gosplan or are established with permission of the USSR Council of Ministers. These changes must be considered in the plan.

In order to increase the responsibility of subcontracting organizations (outside organizations as well as those subordinate to the general contractors) in fulfilling the construction assignments, these organizations must necessarily take part in coordination of project-estimate documentation, in formulating the plan for contract work, and in reviewing documents confirming the provision of the construction with equipment.

13. Crediting of expenditures for unfinished production of construction-installation work by glavks and ministries participating in the experiment is done regardless of the state of contributions of the customer's own funds for financing the capital investments. Crediting is done within the limits of the funds accumulated for this purpose throughout the USSR Stroybank as a whole.

14. The glavks and ministries participating in the experiment perform their activity on the basis of full reimbursement, covering all the plan expenditures at the expense of deductions from profits. This includes expenditures for the development of the production base for construction, the introduction of achievements in science and technology, and economic incentives.

The amount of profit remaining at the disposal of the glavks and ministries participating in the experiment and deducted by them into the state budget is defined in the annual plans in accordance with the approved standards.

The standard for deductions from profits remaining at the disposal of the glavks and ministries participating in the experiment is defined in accordance with the order envisioned by the Methodological Directives for further improving the planning of production-management activity of the BSSR Ministry of Industrial Construction and increasing the role of economic methods in its operation. These directives were approved by the USSR Gosplan Interdepartmental Commission on questions of the application of new methods of planning and economic stimulation on 16 October 1975 (protocol No 3176, section II), and are being approved by the USSR Mintyazhstoy, USSR Minpromstroy, USSR Ministroy

and USSR Minsel'stroy. In this case, the interest on bank credit issued to cover expenditures for unfinished construction-installation work production is paid at the expense of profits in order of their distribution.

15. Expenditures for technical retooling of fixed capital at construction-installation organizations subordinate to the glavks and ministries participating in the experiment and incurred at the expense of the production development fund assets and bank credit, as well as the funds directed toward the construction of facilities of non-production function at the expense of the fund for social-cultural measures and residential construction, are provided for these organizations within the make-up of state capital investments and are allocated separately in the plan as non-centralized capital investments.

The indicated organizations independently resolve questions of utilizing the fund for social-cultural measures and residential construction, keeping in mind the fact that the directions in which this fund is applied must be discussed and approved by the labor collectives.

The assets in the production development fund and the fund for social-cultural measures and residential construction (in part directed toward the construction of facilities of non-productive function) accumulated by the indicated organizations are not subject to withdrawal.

The fulfillment of work at the expense of the indicated funds is the plans for contract work in full volume and is provided with material-technical resources in the same order as for state centralized capital investments.

16. The construction and installation organizations subordinate to the glavks and ministries participating in the experiment are fully supplied with material-technical resources on the basis of the project-estimate documentation.

The territorial organs of the USSR Gosstab [State Committee for Material and Technical Supply] provide for the monthly guaranteed realization of funds for the indicated organizations on the basis of economic agreements concluded between them.

Property responsibility of enterprises for late deliveries of products within the system of the USSR Gosstab, the construction organizations, and the enterprises and organizations manufacturing the products, as well as responsibility for under-delivery of products, for non-adherence to the agreed upon schedule, and other infractions are defined in the order provided by the Statute on Deliveries of Products of Production Function, ratified by resolution No 161 of the USSR Council of Ministers and dated 10 February 1981.

12322  
CSO: 1821/118a

LONG DISTANCE HAULING OF MATERIALS TOO COSTLY

Moscow EKONOMICHESKAYA GAZETA in Russian No 4, Jan 85 p 9

[Article by A. Galaburda, engineer: "Why Has Sand Become a 'Scarcity'?"]

[Text] Without exaggerating we may say that at the present time there are no more scarce materials in the production of prefabricated reinforced concrete than fractional rubble from hard rock and graded sand. This is despite the fact that the output of nonmetalliferous materials is constantly increasing. For example, while in 1975 there were 335 million cubic meters of rubble produced, in 1983 this figure was 407 million cubic meters.

But here are some other figures. In 1983, the production of graded sand comprised only 5.6 percent of the overall volume, and the production of fractional rubble and gravel--26.7 percent. Builders were forced to use a sand-gravel mixture. This mixture, as a rule, is contaminated with clay and silt and makes it impossible to achieve the necessary quality. As a result, every year there is an average over-expenditure of 6 million tons of cement. This amount would be quite sufficient for building modern residential houses with overall area of 24 million square meters. At the same time, 1.3 million tons of specified fuel is spent for its production. The application of poor quality nonmetalliferous materials reduces the strength of reinforced concrete constructions, which increases their volume and weight, and consequently also makes them more expensive.

The need for rubble and sand is not uniform in different regions of the country. The extraction of these materials is concentrated primarily in the Urals, the Ukraine, and in Karelia. Of course, these areas have considerably fewer problems. Yet high quality nonmetalliferous materials must be brought into the central oblasts of Russia, sometimes for a distance of 1,000-1,500 kilometers. The transport of nonmetalliferous building materials for long distances is 2-3 times more expensive than the cost of these materials. Additional transport expenditures comprise, according to rough computations, over 30 million rubles per year.

Is this really unavoidable?

Rubble may be extracted from mined deposits of limestone and from sand-gravel quarries. The enrichment of the rock by strength should be organized for this purpose. The methods of doing this have long been known.

The first steps are already being taken at the RSFSR Minstroyaterialov [Ministry of the Construction Materials Industry]. Thus, the enrichment of rubble is being organized with the aid of a jigging machine. The Khrantsovskiy Sand and Gravel Quarry in Ivanovo Oblast and the Gremyachevskiy Quarry in Gorky Oblast, where the limestones are of low strength (an average of 200-300 kilograms per square centimeter) used four-stage pulverization of the rock in rotor crushers. This yields a high quality rubble of grades "400" and "600".

However, such examples are few. In most cases the managers of the enterprises to whom the quarries belong do not want the extra burden, particularly since it yields no specific economic benefit for the individual enterprise. Yet the national economy receives a considerable effect. After all, the enrichment of a cubic meter of rock costs 50 kopeks, while its transport costs 5-6 rubles and also utilizes railroad transport.

Finally, with the aid of portable crushing-sorting installations it is possible to utilize numerous small deposits in the European part of the RSFSR. This would make it possible to quickly and inexpensively organize the extraction and processing of nonmetalliferous building materials on site. Specific experience has already been accumulated at the RSFSR Ministry of Highways and at Roskolkhozstroyob'yedineniye [Russian Kolkhoz Building Association]. However, this experience is not being widely promulgated, since the Minstroydormash [Ministry of Construction, Road and Municipal Machine Building] industries are manufacturing only 35 percent of the necessary number of installations.

The cost of production in the nonmetalliferous materials industry in the overall volume of construction-installation work comprises 4.5 billion rubles. This is more than the cost of the "bread of construction"--cement. Evidently, there should also be appropriate concern for the manufacture of modern equipment for extraction, and especially for enrichment, of rubble, sand and gravel.

We believe that the local Soviets of People's Deputies should also be more attentive to the questions associated with the extraction of nonmetalliferous materials.

Great reserves are being left unutilized in the nonmetalliferous construction materials industry. These must be placed in the service of the economy.

12322

CSO: 1821/057



CONSTRUCTION PLANNING AND ECONOMICS

EXCESSIVE OVERHEAD IN UKRAINIAN CONSTRUCTION MINISTRY

Moscow EKONOMICHESKAYA GAZETA in Russian No 4, Jan 85 p 19

[Article by N. Shklyaruk, deputy chief of Planning and Financial Organs Section, UkSSR People's Control Committee: "How Departmental Waste is Born"]

[Text] An old proverb which says "One with small fry, seven with a spoon" involuntarily comes to mind in connection with the investigation on adherence to staff-estimate discipline at enterprises and organizations of the UkSSR Ministry of Installation and Special Construction Work.

It has been determined, specifically, that small construction organizations are being slowly consolidated in the sector. The structure and staff of institutes, laboratories, standards-research stations, and other subdivisions have not been placed in order. As a result there is much parallelism and duplication of effort in their work.

One of the important mobilizing factors in improving the structure of the management apparatus are the tasks on reduction of administrative personnel. However, the Ministry is following a different course--the course of mechanistic exclusion of individual duties from the staff rosters. As a rule, these are service personnel.

In 1984, over 1,000 job descriptions were cut from the staff rosters of enterprises and organizations of the UkSSR Minmontazhspetsstroy in response to the assignment for staff reduction, and only 30 people were liberated as a result of the structural changes. And it turns out that, for example, the creator of new technology, the engineer, serves as a typist for his wages, while the economist registers the mail...

For many years, maximal allocations have been approved for enterprises, organizations and institutions for the support of the management apparatus. However, certain chiefs of main administrations, trust managers, heads of construction and start-up and finishing administrations, and plant directors, like athletes running the hurdles, have leaped over all the boundaries. As an investigation showed, every fourth organization within the UkSSR Minmontazhspetsstroy system has exceeded its limit of administrative expenses. Over 3 million rubles of state funds have been over-spent.

For example, within the organizations of Ukrglavspetsstroy [Ukrainian Main Administration on Special Construction Work], headed by A. Kopyla, 114 over-staff workers within the management apparatus were maintained at the expense of the numbers and wage fund of the production personnel. Within the course of the year, 645,000 rubles were spent illegally. The over-expenditure of funds according to the estimate of the glavk apparatus itself was also concealed.

A chronic tendency toward waste was also observed at the Ukrglavkhimteplo-montazh Main Administration, which was headed until recently by K. Ostapenko. The staff-estimate discipline seemed not to exist for him, and he engaged in reckless arbitrary management with no second thoughts. With negligence on the part of the Ministry, the glavk set a unique record: within the ranks of the subordinate construction organizations, every fourth or fifth worker became an administrator. The accounting records concealed 230,000 rubles of illegal administrative expenses. Moreover, an over-expenditure in the sum of 8,500 rubles for rental of service auto transport for use by glavk management workers was also concealed.

The manager of the Koksokhimteplo-montazh Trust V. Vasilenko and manager of the Chernomorpromsantekhmontazh Trust V. Ptashkov also allowed gross disruptions of state discipline.

It would seem that the sectorial managers must set the example for reducing the cost and simplifying the apparatus. In this case, this did not occur. Being unable to operate within the framework of the maximal allocations, the UkSSR Minmontazhspetsstroy systematically passed off a considerable portion of the expenditures for its central apparatus to lower, including production, segments.

An analysis has shown that the Ministry was not exacting enough to managers of enterprises and organizations for the over-expenditures of maximal allocations and for disruption of staff-estimate discipline which they allowed. Liberalism and lack of principle were evident in regard to distortion of state accounting. The Main Planning-Economic Administration and other services of the central apparatus also did not set the example. Departmental control was also ineffective. It is enough to compare two figures. In one year, only 15 over-staff units were found through the efforts of departmental control, while in actuality there were 635.

The materials of the investigation were examined at a meeting of the UkSSR People's Control Committee and the collegium of the UkSSR Minmontazhspetsstroy, as well as at the glavks, trusts, building organizations and enterprises. A principle evaluation was made of the shortcomings and disruptions which had been revealed, and specific measures for correction of the situation were outlined. A number of management workers were brought to strict disciplinary and material responsibility.

12322  
CSO: 1821/055



PLAN FULFILLMENT FOR MOSCOW CONSTRUCTION REVIEWED

Moscow MOSKOVSKAYA PRAVDA in Russian 20 Feb 85 p 2

[Article: "A CPSU MGK [Moscow Gorkom] Conference"]

[Text] A conference of supervisors from the Moscow Municipal Ispolkom, main administrations for construction, and a number of administrations and departments, and directors of industrial enterprises was held yesterday at the CPSU MGK.

The chief of the Main Moscow Industrial Construction Administration, G. N. Kaminskiy, gave a report.

The results of meeting the plan for industrial construction in 1984 and the goals for ensuring that industrial and production projects and the most important national-economic capacities are put into operation in 1985 were reviewed at the conference.

V. V. Grishin, first secretary of the CPSU MGK, spoke at the conference.

Secretary of the CPSU MGK, I. D. Pisarev, took part in the work of the conference.

At the meeting it was noted that organizations in the Main Moscow Industrial Construction Administration ensured that the 1984 goals for the volume of construction and installation work were met ahead of schedule. The plan for construction commodity production was met. More than a million square meters of production space including 70 of the most important national-economic projects and capacities were put into operation.

Along with this it was emphasized at the conference that there are significant deficiencies in urban industrial construction. The state of affairs is improving extremely slowly. The plan for putting fixed assets into use at production projects was not met by many ministries and departments in 1984. Fixed assets were put into operation especially poorly at enterprises in ministries for the Chemical and Petroleum Machine Building, the Electrical Equipment Industry, the Petroleum Refining and Petrochemical Industry, the Timber, Pulp and Paper, and Wood Processing Industry, Light Industry and the Food Industry.

The new year also began by not meeting the plan for utilizing capital investments. In January, 80 percent of the limit of capital investments for the city as a whole were utilized and 85.1 percent of the limit for construction and installation work. The state of affairs with respect to providing financing, design and estimate documentation and certain types of technological equipment for a number of starting projects in 1985 gives rise to a valid concern about their start of operations during the current year.

As before, the primary reasons for the unsatisfactory state of affairs at a number of construction sites is poor organization of production and insufficient supplies of materials and technology. A severe deficiency of workers is felt at many projects and the problem with the dispersion of forces and means is not being surmounted.

However, the matter does not rest with construction workers alone. Up to the present time many clients have not provided contractor organizations with starting complexes, have not approved title lists, have not drawn up equipment delivery schedules, and have not decided a number of other questions. This relates most of all to supervisors of the "Dinamo" and "Kompessor" Plants, GPZ-1 [not further identified], the VNII [All-Union Scientific Research Institute] for Genetics, the Southern Riverside Station, a bakery and confectionary combine in Vykhina, the Ochakov Dairy Plant, and the "Koloss" Production Association.

As is generally known design and estimate documentation must be given to builders before 1 July of the year preceding the plan year. However, up to the present time technical documentation has not been given in full for the following projects in the plan for the current year: the chemical plant imeni P. L. Voykov, a copper smelting and copper electrolyte project, a meat-packing combine in Biryulev, an ENIMS [Experimental Scientific Research Institute for Metal-Cutting Machine Tools], and a dairy combine in Lianozov. And the quality of the design and estimate documentation leaves something to be desired. An increase in price occurs for almost every project during the process of construction due to work that was not taken into account, and due to various revisions and additions that are introduced in the design. The late and incomplete issue of design and estimate documentation does not make it possible to accurately organize the work at the construction sites in accordance with the technology.

It was emphasized at the conference that supervisors of client-organizations, ministries and departments must bear equal responsibility with the construction organizations for the unconditional start-up of planned projects and capacities. Client-organizations and enterprises must resolve all questions without exception that depend on them.

Schedules for the completion of design and estimate documentation work and the delivery of equipment must be coordinated with contractor organizations and strictly adhered to by them. Construction workers must be provided with everything that they need in the shortest period of time. Concern should be given early on to forming the management to operate the complexes and

projects, and contracts should be concluded for start-up and adjustment work. The staff must be filled out with operational personnel in time.

Much work lies ahead of construction workers. During the current year organizations in the Main Moscow Industrial Construction Administration together with client-enterprises must put capacities and projects into operation at Moscow Plants that are of first-degree importance for the state: a petroleum refining plant, the "Serp i molot" Metallurgical Plant, the "Krasnyy proletariy" Machine Tool Building Plant, the "Zarya svobody" Shoe Factory and other enterprises.

It is important to correctly count and deploy our forces right from the beginning of the year. Labor, material and technological resources must be concentrated first of all at starting construction sites. It is necessary to work out schedules and measures based on engineering principles that will ensure that they are put into operation on time. It is important that the executors of the work are kept informed about these schedules.

Problems in further improving the planning, organization and management of capital construction in light of the requirements of the CPSU Central Committee must continue to be solved.

Defective work must be decisively eliminated at each construction site and the responsibility of line personnel, foremen and workers for the quality of the completed work must be increased.

An increase in the industrialization of construction as one of the ways of intensifying production and the quality of work should play no small role in this problem. Design organizations in the Main APU [Architectural and Design Administration], and enterprises in the building materials industry must significantly speed up work in this direction. Lightweight metals and other modern components and materials should be actively adopted in designs which will make it possible to reduce labor consumption and the timeframe for building projects.

Economic administrators, party and labor organizations should not forget about creating proper everyday conditions, and setting up normal nutrition for workers at construction sites. Supervisors of client enterprises should render the necessary assistance in this matter.

The conviction was expressed at the conference that construction workers in the Main Moscow Industrial Construction Administration, client-enterprises, ministries and departments will do everything to meet the plan in 1985, complete the five-year plan in a proper manner, and greet the 27th CPSU Congress with new labor successes.

9495

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INDUSTRIAL CONSTRUCTION

PAYBACK FROM MODERNIZATION OF INDUSTRIAL PLANTS VIEWED

Moscow PROMYSHLENNOYE STROITEL'STVO in Russian No 12, Dec 84 pp 2-4

[Article by Doctor of Economic Sciences and Professor B. S. Bushuyev and engineer A. A. Alibekov (Academy of Social Sciences attached to the CPSU Central Committee), under the heading "Renovation Experience and Problems": "Perfecting the Organizational-Economic Mechanism of Renovating and Retooling Industrial Enterprises"]

[Text] At the present stage, questions of accelerating scientific-technical progress, of achieving its greatest effectiveness, are acquiring ever-growing importance in the implementation of CPSU economic strategy.

It is assumed that the party policy, based on the action of the objective laws of socialism, can best be effected by combining the achievements of the scientific-technical revolution with the advantages of the socialist economic system.

K. Marx and V. I. Lenin foresaw that the basis of qualitative, intensive growth in socialist production would be "...more effective means of production,"<sup>1</sup>... "the implementation of measures to replace manual labor with machine labor."<sup>2</sup>

The increasingly complex mining and geological conditions of mineral extraction, problems in the country's demographic situation and many other factors are necessitating more substantial growth in the volume, and particularly in the qualitative, indicators of production, not only without increasing the number of workers, but with a reduction in workers.

The materials of the 26th CPSU Congress and those of subsequent CPSU Central Committee Plenums have repeatedly pointed out the necessity of developing an economic and organizational mechanism which will best stimulate outstripping growth in production efficiency in comparison with expenditures of labor, materials and other resources per unit of finished output which is not inferior in quality to that of the best world models and even surpasses them. This concept is reinforced by many years of experience in successfully implementing economic and social development plans; it relies on the strong scientific-production potential which has been created in the country.

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<sup>1</sup>K. Marx and F. Engels, "Soch." [Works], Vol 24, p 193.

<sup>2</sup>V. I. Lenin, "Poln. sobr. soch." [Complete Collected Works], Vol 1, p 100.



The path of quantitative growth alone in production volume is no longer dominant under present conditions; growth must be closely interconnected with factors of growth in qualitative indicators, a stronger role for social factors of the development of labor collectives and the end results of their activity.

In our country, the whole system of centralized planning and party leadership of capital construction orients industrial construction towards increasing the country's production potential on a new technical basis, towards accelerating the updating of production assets and increasing their socioeconomic effectiveness. For that reason, the CPSU Central Committee and USSR Council of Ministers decree "On Improving the Planning, Organization and Management of Capital Construction" particularly stressed the fact that, when developing capital construction plans, it was ensured that capital investments would be directed first of all towards carrying out measures connected with introducing the latest scientific and technical achievements into the national economy, towards retooling and renovating existing enterprises, the comprehensive development of raw-material and processing branches, and eliminating interbranch and intrabranh disproportions. At the same time, a procedure has been instituted whereby the construction of new enterprises can be included in a plan on the condition that the capacities of existing enterprises of a given branch are being fully used, with consideration of their retooling and renovation, and that capital investments have been allocated for the prompt start-up of carry-over construction projects, as well as given estimate-planning documentation establishing the necessity of start-up projects and approved for established periods.

To put it another way, in the planning process, new construction and existing production must be viewed as a single entity, with priority being given to the best use of capacities, to the renovation and retooling of existing enterprises. It is this path which best facilitates intensification of socialist production and the economical use of labor, material and financial resources in the sphere of expanded reproduction.

According to the USSR Gosplan Methods Instructions<sup>1</sup>, renovation of existing enterprises includes that construction done following a unified plan (excluding the construction of new and expansion of existing basic production shops, but including the construction, when necessary, of new and expansion of existing auxiliary and service facilities), with the replacement of obsolescent and obsolete equipment, production mechanization and automation, the elimination of disproportions in technical links and auxiliary services ensuring an increase in production on a base of new and improved technology, expanded assortments and higher product quality, the creation of low-waste and waste-free production facilities, as well as improvement in other technical-economic indicators with lower expenditures and faster than when building new or expanding existing enterprises. The renovation of existing enterprises includes as well the construction of new shops or facilities of the same capacity (productivity, volume) or of a capacity corresponding to enterprise end product volume in place of similar shops and facilities which are being eliminated because their continued operation is inexpedient for technical or economic reasons. The Methods Instructions position "excluding the construction of new and expansion of existing basic production

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<sup>1</sup>"Metodicheskiye ukazaniya k razrabotke gosudarstvennykh planov ekonomicheskogo i sotsial'nogo razvitiya SSSR" [Methods Instructions on Developing State Plans for USSR Economic and Social Development], Moscow, Ekonomika, 1980, pp 421-422.

shops" often causes disputes among Stroybank workers and general contractor construction trusts concerning including the latter in a higher wage group for engineering-technical workers if the renovation work volumes exceed 50 percent of the total amount of work done by the corresponding trust.

In practice, given the conditions under which highly productive new equipment is installed, we quite often require some expansion not only of auxiliary facilities, but also of basic shops (production facilities). It is therefore necessary to introduce appropriate adjustments in the Methods Instructions.

The retooling of existing enterprises includes the implementation, in accordance with the plan for technical development of the association (enterprise) based on plans and estimates for individual facilities or types of work, of a complex of measures (excluding the expansion of existing production space) to raise the technical level of individual production sectors, units and installations to modern technical standards through the introduction of new equipment and technology and by mechanizing and automating production processes; modernization and replacement of obsolete and obsolescent equipment with new and more productive equipment, improvement in production organization and structure, the elimination of bottlenecks, improvement in the plant-wide economy and in auxiliary services, as well as other organizational and technical measures aimed at ensuring an increment in the production of output (services), in their quality, in labor productivity and in working conditions and labor organization, reducing net cost and improving other technical-economic indicators of enterprise operation.

As a result of the renovation and retooling of existing enterprises, new, modernized production capacities are put into operation and mastered faster than newly-built facilities. In this regard, the proportion of equipment in the production assets structure and the return on capital are generally increased.

The most important result of the retooling and renovation of existing enterprises is the restructuring of the production facility of a base of progressive new technology which ensures not only growth in the production of corresponding types of output, but also expansion in the assortment and quality improvement. At the same time, important social problems are solved: manual operations are eliminated, more favorable working conditions are created, which in turn leads to improved labor productivity and reduced personnel turnover.

It should be noted that the renovation and retooling of existing production facilities is underway here on an ever-widening scale. Thus, during the 1980-1983 period, capital investments in retooling and renovating production facilities grew from 21.5 billion rubles (1980) to 25.3 billion rubles (1983), or by 15 percent.<sup>1</sup>

There are many examples of the effectiveness of renovating and retooling existing enterprises.

Thus, a Kirovets tractor repair shop at the Kzyl-Ordinskiy Mechanical Repair Plant of the Kazakh SSR State Sel'khoztekhnika Committee was renovated and

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<sup>1</sup>"Narodnoye khozyaystvo SSSR v 1983 g." [USSR National Economy in 1983], p. 356.



retooled in 1983. The estimated cost was 417,000 rubles, including 147,000 rubles in construction-installation work.

The renovation enabled them to increase production space by 3,562.5 m<sup>2</sup>, and will enable them to perform major overhauls on the K-700 tractor chasses and units and to rebuilt parts for it. Plant capacity increased by 1.06 million rubles worth of marketable output. Shop profit is 178,800 rubles per year.

The prefabricated reinforced concrete shop at the building materials combine of the Kzylordastroy Trust was renovated, providing an opportunity to increase designed capacity from 11,100 m<sup>3</sup> to 23,800 m<sup>3</sup> of prefabricated reinforced concrete per year. It has mastered the release of progressive columns, wall panels and roofing slabs. The stock of flanged items has been improved. Before renovation, all such items were brought in from another oblast, over distances of up to 500 km. After the shop renovation was completed, at an estimated cost of 1.9 million rubles, labor productivity was increased by 17 percent.

At the same time, economic analysis showed that the actual rates of fixed assets updating is about one percent in a number of leading Group A branches (ferrous metallurgy and others), given a minimum necessary 3-4 percent and an appropriate updating normative of 5.6 percent for the national economy as a whole. In our opinion, the branch structure of capital investments must in the future be more dynamic. Improvement in it must be subordinate to the interests of accelerating scientific-technical progress, intensifying production, and meeting better society's requirements for specific types of material and cultural goods. For example, the development of nuclear thermal electric power engineering, laser and microprocessor equipment, robot engineering, new types of food production facilities, and so on, will require substantial change in the branch structure of capital investments and corresponding change in the structure of contractor construction-installation work as well.

The CPSU Central Committee and USSR Council of Ministers Decree "On Improving the Planning, Organization and Management of Capital Construction" established that the renovation and retooling of existing enterprises on a base of introducing highly efficient new technological processes and equipment must be basic policy in the years just ahead and beyond. An important place in resolving this task will be occupied by all participants in the construction complex, and especially by the planning and construction-installation organizations. Planning the renovation of existing enterprises is a complex process which demands, under present conditions, an efficient combination of highly effective new technologies in basic production and "flexibility" in the construction portion of production buildings. Such production building "flexibility" can be effected along two lines.

The first line consists in building one- and two-story production buildings using metal frames or prefabricated reinforced concrete components, with a wider column and span grid, as well as in situating various utility installations (transformer substations, ventilation systems, and so on) on flat upper surfaces.

The second line consists in building production buildings out of lightweight dismountable assembled metal components (modules) supplied as part of a set including the necessary utility installations. We note in world practice the ever

broader implementation of the position that the service life of industrial buildings should coincide with the service life of the equipment, that is, of building buildings which are less durable and less expensive. Inasmuch as, given the current intensification of production, equipment service life fluctuates from three to 15 years, many foreign companies consider it disadvantageous to build buildings with a service life of 25 to 100 years, as was previously the case. At the same time, ensuring building "flexibility" permits having longer production building service life and the modernization of technological processes as necessary.

Under USSR conditions, it is useful to follow both the above-indicated directions, depending on the nature of the production and the features of the country's climatic zones. At the same time, the existing organizational-economic mechanism in capital construction still does not do enough to stimulate planning and construction-installation organizations to design and build facilities with flexible production structures (GPS). First, single- and two-story production buildings designed for GPS are lower in estimated cost than multistory buildings in a number of instances; they have lower build-up coefficients and are consequently "disadvantageous," both for planners and for builders.

The existing conflict between the volume indicators for planning and construction-installation work, on the one hand, and stimulus factors, on the other, can, in our view, be resolved through the institution of priority coefficients for progressive planning resolutions and for their practical implementation by construction-installation organizations. Such coefficients should be instituted for wage fund size, labor productivity calculations, deductions to economic incentives funds, and the funds needed to do this should be anticipated in a separate section in the summary estimate for the corresponding facility. The reference is to making lighter, cheaper, more progressive building and installation components profitable for planning and construction organizations. The urgency and necessity of solving this problem are increasing constantly.

Another problem is to improve the methods of evaluating the economic and social effectiveness of renovating or retooling an existing production facility. The economic effectiveness derived from capital investments in renovating or retooling and enterprise,  $E_{ren}$ , is usually calculated using the formula:<sup>1</sup>

$$E_{ren} = \frac{\sum B_i (C_0 - C_1)}{K_{ren}},$$

where  $B_i$  is the increment in production volume of output  $i$  after renovation or retooling of the enterprise;  
 $C_0$  and  $C_1$  are current expenditures (net cost) of output  $i$  prior to and after renovation or retooling of the enterprise;  
 $K_{ren}$  is capital investments on renovating or retooling of the enterprise.

<sup>1</sup>"Metodicheskiye ukazaniya k razrabotke gosudarstvennykh planov ekonomicheskogo i sotsial'nogo razvitiya SSSR," p 445.

The formula is based on volume-cost indicators of output increment resulting from the renovation or retooling of existing enterprises. It does not contain indicators reflecting the social results of updating (modernizing) an existing production facility.

In this connection, it does not always turn out to be possible to determine and objectively evaluate the specific contribution of construction workers to growth in the country's production potential on a new technical base at both the national economic and the regional levels. At the same time, under developed socialism, the ability of new and renovated production capacities to meet the demands of socialist society for specific types of material goods and services, to create the best conditions for the comprehensive development of the individual, is of the greatest importance. In a number of their works, K. Marx and V. I. Lenin put forward fundamental postulates on evaluating the productive forces of socialism and communism based on the criterion of social progress. It is known that K. Marx considered the development of production assets and orienting them towards creating consumer values, foremost in the form of products intended for individual consumption, to be one of the most important criteria of social progress.<sup>1</sup>

V. I. Lenin considered the creation of mechanized equipment which would free people from heavy manual labor to be the most important criterion for developing productive forces. "The more equipment is developed," he wrote, "the more manual labor will be eclipsed and replaced by increasingly complex machines: machines and the items necessary to manufacture them will occupy an increasingly important place in social production."<sup>2</sup>

In connection with the saturation of renovated enterprises with new equipment models, we think more attention should be paid to the following factors. First, to the extent to which the productivity and qualitative characteristics of the new machinery and equipment outstrip their cost. Analysis shows that the price of certain types of machine tools, metallurgical and power engineering equipment exceeds by 30 percent or more the growth in their productivity, leading to a lower return on capital for new and renovated enterprises. Second, does the equipment being developed and supplied by the machinebuilding ministries ensure a real savings in live labor, a savings in material expenditures, and improved product quality? Third, the completeness of the equipment package supplied to enterprises being renovated is a factor of considerable importance. The latter is of particular importance in connection with the experimental construction, beginning in 1985, of a number of "turnkey" production, social- and personal-services projects and housing blocks in conformity with the CPSU Central Committee and USSR Council of Ministers decree "On Improving the Planning, Organization and Management of Capital Construction."

The appropriateness of establishing a procedure in accordance with which the machinebuilding ministries, as the general suppliers of equipment, would deliver,

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<sup>1</sup>K. Marx and F. Engels, "Soch." [Works], Vol 46, Part II, p 215.

<sup>2</sup>V. I. Lenin, "Poln. sobr. soch." [Complete Collected Works], Vol I, p 100.

under contract to the general construction trusts (and including installation oversight and initial adjustment), full sets of equipment, technological pipelines and fittings, automation and mechanization equipment, and other items for the corresponding projects, including equipment and items obtained on a cooperative basis.

Only given the appropriate responsibility of all participants in the construction complex for the end results of renovations to and the retooling of industrial enterprises will it be possible to achieve high efficiency in this most important direction of intensive development of the national economy.

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## INDUSTRIAL CONSTRUCTION

## MODERNIZATION OF CONCRETE PRODUCTION PLANTS VIEWED

Moscow PROMYSHLENNOYE STROITEL'STVO in Russian No 1, Jan 85 pp 27-28

[Article by L. I. Nodel', chief engineer of the Zhelezobeton [Reinforced Concrete] Trust (USSR Ministry of Construction Glavprivolzhskstroy)]

[Text] As we know, the main indicator of the effectiveness of our economy is labor productivity--the amount of production created in a unit of time. The faster this indicator grows, the more favorable the conditions for strengthening the economic might of the country and for continued improvement in the standard of living of the workers.

The 26th CPSU Congress noted that the most important task of our society is the active participation in the all-people's struggle for further increasing labor productivity on the basis of achievements in science, engineering and leading technology, comprehensive mechanization and automation of production processes, and reduction of manual operations. The necessity of such a course was once again confirmed at the February and April (1984) Plenums of the CPSU Central Committee.

The reduction of manual operations in the production of prefabricated reinforced concrete is one of the most important tasks facing the collective of the Zhelezobeton Trust. Every year the trust and its enterprises work out their own plans for improving production technology, for better application of equipment, and for increasing the level of mechanization of labor-consumptive operations.

The past few years have been years of mass transition of the technological lines at the trust's plants to mechanized methods of placing and compacting concrete mixtures. Around 15 units of new forming equipment have been installed: new types of concrete placers, vibration tables of new design, including types VPG and VPS designed by the Poltava ISI (low noise). The application of new vibration forming equipment has made it possible to fully eliminate manual vibration instruments on certain technological lines.

The experience of one of the trust's plants is interesting. Here, large-size structures are manufactured at the proving ground with test-bench technology. These structures include columns for single-story industrial buildings, all types of beams and cross bars, parts for purification structures, etc.

In order to reduce labor consumption and increase the level of mechanization, a concrete placer with lane width of 17m was installed over the steam-curing chambers. This sharply increased the labor productivity and the product output per square meter of production area. This test site was one of the first in the system of the USSR Ministry of Construction, which in 1968 was the first to use metal-concrete outfitting.

The trust enterprises have achieved definite success in reducing manual labor by developing armature-welding operations. Semi-automatic technological lines for waste-free preparation of rod armature have been installed and are operational at all plants. These lines have eliminated the labor consumptive process of joining the rods with the aid of electric arc welding. These lines considerably increase the labor productivity and make it possible to save on metal, using short rods for butt-joining, which previously were considered to be industrial scrap. In welding the reinforcement grids and carcasses, up to 70 percent of the work is done with the application of resistance spot welding. This has made it possible to reject electric-arc welding and joining of the products.

A large number of steam-curing chambers for heat treatment of reinforced concrete products are operating in an automatic mode. This eliminates manual labor in measuring the temperature in the chambers.

Generally, containerization of transport and warehousing of finished armature products and fittings has been introduced. This has sharply reduced unproductive manual labor for transfer of parts and has made it possible to effectively utilize the production areas.

Semi-automatic machine tools for manufacturing short stock have been introduced at most of the trust's plants. These have eliminated manual labor by fitters in making such pin-rods on special cutters. High-speed welding under a flux layer is used for making fittings instead of using manual electric-arc welding.

The ZhBK-1 Plant has completed reconstruction of its MIMK-3x100 welding machine for the purpose of mechanizing the manufacture of heavy plane carcasses and grids. Previously these products were welded on a single spot welding machine, and the carcasses and grids were moved by hand.

Re-usable rubber inserts have been introduced for forming openings for electrical wiring in the manufacture of gypsum-concrete partitions. Metallic inserts were previously used for this purpose. They were heavier and more labor consumptive in removing casings and cleaning off the adhered gypsum concrete.

In 1983, the locking devices on mechanized benches for manufacturing series 90 sanitary engineering units have been modernized. Instead of clamping type locks which had to be closed by hand, pneumatic locking devices have been introduced. As a result, manual labor has been eliminated for this operation, labor productivity has increased, and the quality of casing closure has improved.

In the first quarter of 1984, the plant mastered the output of hollow slabs with reduced cross reinforcement in accordance with the blueprints of the Volgograd branch of the NIIZhB [Scientific-Research Institute on Concrete and



reinforced concrete. This has reduced the labor expenditures in reinforcing products and has increased the labor productivity.

In 1983 the ZhBK-2 Plant introduced into operation a technological line for waste-free lime slaking for the preparation of compound solutions. The line is fully mechanized and is serviced by a single operator. Its introduction made it possible to free two people, to fully eliminate manual labor, and to increase the labor productivity.

In 1983 the ZhBK-3 Plant built a section for the preparation of chemical additives and mechanized the process of supplying and batching these additives in the preparation of concrete mixtures. Prior to this time the chemical additives were introduced by hand into the concrete mixtures.

A mechanized post for washing outside wall panels finished with ceramic tiles has been organized at the ZhBK-4 Plant in Volsk. It is based on the SMZh-259 machine for cleaning cassette sheets. Previously the panels had to be washed by hand. The introduction of this installation made it possible to eliminate the manual labor and to increase the labor productivity. It yielded an economic effect of 2,377 rubles per year.

Work is presently being conducted on automation of BSU [concrete mixers] at the ZhBK-1, ZhBK-2 and ZhBK-3 Plants. The completion of this work will make it possible to reduce the number of service personnel and to fully automate the process of preparing concrete mixtures.

The trust's plan for organizational-technical measures for 1984 provided for changing over 70 percent of the chambers for heat and moisture treatment of products to work in the automatic mode. The construction of a section with modern technology for preparing chemical additives is planned for 1984-1985 at the ZhBK-2 and ZhBK-4 Plants.

The ZhBK-1 plant is introducing a new progressive method of heat treating keramzit concrete wall panels using products of natural gas combustion with automatic regulation and control of the heat treatment conditions. The introduction of this innovation will make it possible to improve the working conditions and to reduce energy expenditures.

There are plans to introduce another 70 containers at the trust enterprises. This will considerably increase the level of containerization for intra- and inter-shop transport operations.

The trust's plants are preparing for the adoption of the effective super-plasticizer "Aplassan," which is made from the by-products of PO "Nitron." Its application will sharply reduce manual operations for vibration operations, finishing product surfaces, and sizing structures.

In 1984-1985, provisions are being made for the introduction of a new type of reinforcement with application of continuous polypropylene cording for the manufacture of gypsum-concrete partitions at the ZhBK-1 Plant. This will make

it possible to utilize flow-line technology for the manufacture and supply of wooden carcasses and will free workers from the manual operation of placing individual reinforcement carcasses onto the conveyer receiving table.

The application of large-size ceramic tiles with dimensions of 140x250x10 has been mastered at the ZhBK-1 and ZhBK-4 Plants in the manufacture of wall panels intended for the construction of administrative facilities, social-cultural-domestic facilities and residences. The application of these tiles has fully eliminated manual labor in making flooring of small-size tile.

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INDUSTRIAL CONSTRUCTION

REMEDIES FOR LAGS IN CAPITAL CONSTRUCTION VIEWED

Moscow EKONOMICHESKIYE NAUKI in Russian No 10, Oct 84 pp 31-38

[Article by A. Lupa', docent and candidate in economical sciences: "Improving Management and Strengthening the Conditions of Economy in Capital Construction"]

[Text] Rich experience has been accumulated in our country on the planned management of the national economy, on the basis of which the CPSU and the Soviet government is implementing the continued and goal-oriented development of the level of plan work with consideration for the changing conditions of economic development. At the current stage these conditions specifically dictate the need for development and introduction of a scientifically substantiated set of measures for improving the management of the national economy, including also capital construction. The importance of the latter in increasing the country's economic potential is ever increasing. In the 3 years of the 11th Five-Year Plan alone, the overall volume of capital investments in the national economy comprised 432.1 billion rubles, and fixed capital in the amount of over 420 billion rubles was put into operation. Among the facilities introduced into operation were large capacities for the extraction of coal, oil, gas, and ores, for the production of ferrous metals, mineral fertilizers and chemical fibers, and for the manufacture of many types of production in machine building and consumer items. The overall area of residential housing built in 1981-1984 comprises around 433 million square meters, which makes it possible to improve the housing conditions of about 40 million people.<sup>1</sup>

However, we must not stop at the great achievements attained in our country in the sphere of capital construction. Moreover, the transition of the national economy to the path of primarily intensive development means that the state of affairs in this sector require significant improvement. The resolution of the CPSU Central Committee and the USSR Council of Ministers entitled "On Improving the Planning, Organization and Management of Capital Construction" aims the party, soviet and economic management organs toward this end.

Among the measures directed at ensuring increased effectiveness of capital investments as outlined in this most important document, a great role belongs to reduction of the volume of unfinished construction to the established norms within the next few years. In order to achieve this reduction, it is necessary to resolve a number of major questions on increasing the effectiveness of

capital investments. In this connection, we must point out the following questions: the concentration of material and other types of resources at start-up facilities and construction sites; the reduction of the portion of new construction in the reproductive structure of capital investments; the reduction in duration of the building cycle with the aid of expansion of fixed and working capital of building organizations and the improved organization of building production management; the improvement of project-planning decisions; the adjustment of efficient economic stimulation of building organizations for fulfillment of plans on commodity building production and for pre-schedule operational introduction of production capacities. Lately the overall volume of unfinished construction and its ratio to the annual volume of capital investments has increased significantly. The overall volume of "unfinished work" on the whole throughout the national economy from 1970 through 1982 has more than doubled and comprised 108.9 billion rubles, while the relation of volume of unfinished construction to the annual volume of capital investments for this same period increased from 73 to 84 percent.<sup>2</sup>

The transformation of capital investments as a result of building production into the finished product--production capacities and fixed capital--requires a long time, and society is forced to deal with the fact that huge sums are "frozen" for many months. However, with proper distribution of capital investments by years of construction, retention of the necessary construction stockpiles, and adherence to the established final construction times, the time which the funds spend in unfinished construction may be brought down to a minimum which is necessary for building the facilities with consideration for the current technological level.

The USSR Gosplan [State Planning Committee] and the USSR Gosstroy [State Committee for Construction Affairs] have ratified new standards for stockpiles of semi-finished products in construction of enterprises, buildings and structures for the 11th Five-Year Plan, as well as sectorial standards for stockpiles in construction. In accordance with the latest party and government documents on improving capital construction, these documents give a scientifically substantiated methodology for determining construction stockpiles and the level of unfinished construction. The standard stockpiles are approved not only by capital investments, but also by construction-installation work. The standards for the ratio of summary estimate limit remainder for "unfinished work" to the annual volume of capital investments have been approved for the first time.

While stressing the undoubtedly positive significance of the indicated documents of the USSR Gosplan and the USSR Gosstroy, we nevertheless feel it expedient to point out that the increase in construction times and stockpiles as provided by the new standards seems unjustified. We understand that in accordance with the requirements of the times, the estimates for construction and the title lists of the sites must now include expenditures for the construction of environmental protection facilities (including purification structures), facilities of cultural-domestic function, computer centers, etc. Nevertheless, in our opinion this should not influence the times for building enterprises. The introduction of new facilities which had not previously been built must be provided, as a rule, not by means of increasing the times and correspondingly the volumes of



unfinished construction, but rather on the basis of mobilizing the reserves which the building organizations have at their disposal, and which are rather considerable. The real possibilities for industrialization of construction are still weakly utilized, as is the broader introduction of leading technology and leading experience, improvement in the organization of building production, and reduction of work time losses. As a result, the plans for growth of labor productivity are not being fulfilled in construction, and its level is growing very slowly (only 2 percent for 1982). The pool of construction machines is also being used unsatisfactorily. Their average daily work time (as well as the output for the last 5 years) is not increasing and comprises for the present day: for single-bucket excavators--10.8 hours, scrapers--9.8, bulldozers--10.6, and installation and tower cranes--12.4 hours in a 24 hour period. At the same time, intra-shift idle times of machines comprise 16-18 percent.<sup>3</sup>

The problems of reducing the level of unfinished construction are closely tied with the reduction in the number of simultaneously built facilities and the elimination of dissipation of capital investments. The ministries and departments, often without justifiable substantiation, present proposals on beginning construction of new enterprises and facilities. When these proposals are accepted, the building organizations are faced with the need for unjustified distribution of material-technical and manpower resources, which makes it impossible to perform the construction within the normative times. Thus, in the USSR Ministry of Industrial Construction the residual estimated cost of all facilities under construction comprises over 30 billion rubles. The completion of these facilities will take around 5 years, even though the normative durations of the construction time should not exceed 2-3 years. The number of facilities being built by the USSR Minpromstroy comprises several tens of thousands with an average of only 7 workers at each of them.<sup>4</sup> With such an approach to the formulation of plans for construction-installation work, it is difficult to achieve balance and successful fulfillment of the plan assignments.

In the current five-year plan, a new approach is being realized toward setting plan assignments. According to it, the capital investments for new construction and for the expansion of existing enterprises in one sector or another will be allocated only if the operating production capacities (with consideration for their modernization and technical re-tooling) do not provide for an increase in the volume of output production within the framework of the national economic demands. In the course of their work on the outline of the five-year plans, the ministries and departments work out the balances for application of production capacities and fixed capital. The balance of production capacities for the plan period is compiled with consideration for: maximal utilization of already existing capacities on the basis of strengthening the labor and technological discipline; liquidation of losses in work time; increasing the shift application in operation of equipment; growth in capacities due to technical re-tooling and reconstruction. The indicated computations also consider a reduction in the production capacities due to their discontinuation (for reasons of age or because the equipment is written off), as well as a change in the nomenclature and assortment of the output production. Then, summary plans are developed for the reconstruction and technical re-tooling

of existing enterprises and associations. These plans define the need for capital investments and material resources with computations according to effectiveness of the capital investments. Only after implementation of all the indicated computations may a decision be made as to the inclusion of new construction sites into the plan, with consideration of their national economic importance and need, as well as with the condition of effective utilization of capital investments for the growth of the new capacities. In the 80's, the growth of production capacities must be implemented primarily by means of work on the reconstruction and technical re-tooling of existing enterprises. The relative share of such work in the capital investments of production function for 1980-1982 increased by 1.8 percent.<sup>5</sup>

At the present time there is a transition in construction toward evaluating the activity of subsidiary organizations not by the overall volume of the construction-installation work which they fulfill, but by the indicator of commodity building production. It considers not the overall (gross) expenditures for the production of construction-installation work, but only their volume according to the start-up complexes, facilities and lines completed in the plan year, submitted to the customer, and prepared for production output. The effectiveness of this indicator was verified in the course of the economic experiment on improving the economic management mechanism and introduction of cost accounting at the Belorussian SSR Minpromstroy and the Lithuanian SSR Minstroy [Ministry of Construction]. The basis used for development of the annual plans by this indicator were the five-year plans for capital construction, two-year plans for introduction of facilities, and title lists of construction sites. The system of accounting for finished facilities and start-up complexes, crediting expenditures for unfinished building production and economic stimulation of building organizations were also implemented in a new manner in the course of the experiment. Under the conditions of the experiment it was possible to reduce the times for building the facilities, to reduce the cost of the work, to reduce the volume of unfinished construction, and to increase the profits of the building organizations.

In our opinion, it is effective to have a gradual transition to construction of enterprises at the expense of USSR Stroybank [Bank for Financing Capital Investments] credits in the amount of the total cost of construction according to the estimate, and to submit these facilities to the customer "under key." The use of credit will undoubtedly improve the utilization of financial means by the contracting organizations and will facilitate the reduction of construction times.

The problem of transition to construction "under key" is being resolved very slowly today. In industrial construction the portion of accounts "under key" comprises only about 3 percent. The introduction of a progressive form of computation is hindered, since volume indicators generally prevail in the normative acts regulating the process of creating production capacities (for example, the volume of contracted construction work). In the race for fulfilling the volume of work "by gross", builders do not ensure the timely operational introduction of the facilities. Moreover, the contracting building organizations have no economic interests in working according to the new form of accounting, since the savings from reduction in the estimated cost of construction does not remain with the builders.

The system of continuous financing of state capital investments at construction sites of production function has found widespread application in the 11th Five-Year Plan. It provides for continuity of the construction cycle in fulfillment of the annual plan for construction-installation work, as well as for the financing of this work in the volume of estimated cost approved in the title lists. In case of overfulfillment of the annual plan assignment for capital investments, financing will be provided at the expense of bank credit. The increasing role of credit in capital construction is also indicated by the fact that at present it is one of the main sources of financing capital investments. Up to 90 percent of the financial expenditures in building enterprises and facilities with recovery time of up to 5 years are covered by credit. The portion of credit in expenditures for technical re-tooling and reconstruction comprises over 30 percent, and for indemnity construction sites--almost 100 percent.<sup>6</sup>

A current direction in improving the planning of capital construction is the provision of integrated construction of industrial enterprises and residential-civil facilities. Large-scale residential housing, social-cultural and other non-production oriented construction has been developed in our country. It is enough to say that in the years of the 10th Five-Year plan the state has spent 180.3 billion rubles for these purposes, or 28.4 percent of all capital investments. In this period, 527.3 million square meters of housing area has been introduced into operation, 11,300 general education schools, children's preschool institutions for 2.8 million pupils, as well as a large number of hospitals, rest homes, etc.<sup>7</sup> However, the plan assignments for the introduction of housing and other facilities in non-production construction are often not fulfilled. The principle of integrated planning and construction of industrial enterprises and facilities of residential and social-cultural function is by far not always maintained. As a result, the introduced production capacities are not fully utilized, while the state under-receives a large amount of production, since it is difficult to attract the necessary number of workers to the new enterprises. In connection with the lagging behind of non-production construction, the problem of securing the work force in regions of Siberia and the Far East is being resolved slowly.

According to the data of the USSR Gosplan, the production capacities introduced into operation in the 70's and early 80's are being utilized by only 81 percent, while in some ministries (Minnefteprom [Ministry of the Petroleum Industry], Mintsvetmet [Ministry of Nonferrous Metallurgy], Minkhimpron [Ministry of the Chemical Industry], Minelektrotekhprom [Ministry of the Electrical Equipment Industry] and others) the load on production capacities comprises only 50-80 percent.<sup>8</sup> This is explained to a significant degree by the non-adherence to proportions in the development of industrial and civil (primarily residential) construction. For purposes of radical improvement in the state of affairs in housing and social-cultural construction, the CPSU Central Committee has adopted the resolution entitled "On Measures for Ensuring the Fulfillment of Plans for the Construction of Residential Houses and Social-Domestic Facilities", which outlines a clear-cut program for accelerating and improving the quality of construction of facilities in the non-productive sphere.

One of the most important directions in the realization of the indicated resolution by the CPSU Central Committee is, in our opinion, to accelerate



scientific-technical progress in construction, to reduce the construction time for residential houses and to reduce the cost of their construction. The main thing here is to expand the sphere of industrial methods of construction on the basis of effective overall planning, design and technological decisions. In accordance with the indicated resolution of the CPSU Central Committee, the volume of large-panel and volume-block residential construction will be expanded. Its relative share in 1981 comprised 58.5 percent, as compared with 23.1 percent in 1975.<sup>9</sup> At the same time, we must note that the development of large-panel house building has led to the unjustified neglect in construction of wood frame houses, which is economically more expedient, particularly in rural areas. In the last 20 years, the capacities for wood frame house building have been reduced to one-half their previous amount, and today comprise only 6.5 million square meters. The capacities for production of brick, clay blocks and brick panels have been reduced, although this makes it possible to industrialize construction and to make it cheaper.<sup>10</sup>

For purposes of ensuring unity of building production, it is expedient to include facilities of residential and cultural-domestic function within the make-up of start-up complexes and enterprises, which will increase the responsibility of customers and contractors for fulfilling the plan for non-productive construction. This approach is especially current in connection with the decision effective in 1984 to establish plan assignments for the operational introduction of residential and social-domestic facilities for the contracting ministries.

The problem of integrated urban development is of great importance. At the present time, the capital investments for social-cultural construction in the cities are being implemented in two directions: on one hand, along the line of the local Soviets through the union republic Councils of Ministers, and on the other--through the enterprises and associations at the expense of the ministries and departments. Such a practice often leads to the emergence of disproportions in urban management, since the interests of the individual enterprises do not always coincide with the interests of the city. Guided by the expansion of rights and the strengthening of the economic management independence of the local Soviets, the USSR Gosplan presented an initiative for performing an experiment in one or several union republics on turning over all capital investments on residential and cultural-domestic construction to the union republic Councils of Ministers. However, this proposal was not supported at the union republics, since the local Soviets do not have the power or the capacities to implement large-scale social construction. Nevertheless, the problem remains and new efforts are needed in order to resolve it effectively. The resolution adopted by the CPSU Central Committee entitled "On Measures for Ensuring the Fulfillment of Plans for Construction of Residential Houses and Social-Domestic Facilities" particularly stresses the significance and role of the local Soviets in solving the social problems in urban development. The realization of this resolution will make it possible to strengthen the balance and coordination of sectorial and territorial plans for social-cultural construction.

Departmental separation and imperfection in sectorial planning of the social sphere lead to the situation whereby sometimes irrational and ineffective



actions are taken. Thus, for example, in Leningrad many operating enterprises in light industry are working to only one-quarter their capacity due to the shortage of a qualified work force, yet the RSFSR Minlegprom [Ministry of Light Industry] has begun construction of new enterprises in the city.<sup>11</sup> The local Soviets also play an important role in curtailing such irrational actions.

An important direction in increasing the effectiveness of capital construction is the reduction of its material consumption and the careful and rational application of material and financial resources. Construction is one of the most material consumptive sectors of the national economy, which consumes about 12 percent of the products in the sphere of material production by cost and about 35 percent by tonnage. We may judge the importance of economy of material resources in construction also by the fact that, according to the data for 1982, 1 percent economy of cement comprised approximately 1.2 million tons, of glass--2.8 million square meters, and of reinforced concrete products--2.4 million cubic meters. Therefore, primary importance is being given in the current five-year plan to the reduction of losses and to the rational application of building materials, and measures are being implemented for their more effective utilization. The production of progressive asbestos cement and reinforced concrete structures, artificial porous fillers, thermoinsulating fiberglass panels, glass ruberoid, and other progressive types of building products is increasing significantly. This facilitates a reduction in the specific expenditure norms for material resources in construction and in the building materials industry. In the last 12 years, for example, the expenditure of cement computed per 1 million rubles of construction-installation work was reduced by approximately 15 percent. In 1970-1982, cement production increased by 29.9 percent in the country, while the overall volume of construction-installation work increased by 44.7 percent.<sup>12</sup>

In view of all this, construction organizations still have great capacities for better application of material resources. A significant amount of these resources is overexpended as a result of disruptions in the technology of building production, or spent for correcting breakage and liquidating miscalculations allowed during planning. The problem of reducing losses during production and transport of building materials also remains a current one.

The reduction of direct losses in the production of building materials is achieved by means of widespread application of various intensifiers, substitutes, chemical and petrochemical products. For example, a significant savings on cement is obtained due to the application of ash from heat and power plants, granulated slag and binding agent materials in the building materials industry. Improving the quality of urban construction and architectural planning and developing project-planning decisions yield a great reserve for reducing the expenditure of material resources. Through the broader application of hollow brick and ceramic stone for outside wall masonry it is possible to achieve an annual savings of 10-12 million tons of utilized standard fuel for heating the buildings. At the present time, around 400 million tons of standard fuel (25 percent of that consumed in the national economy) are expended in the country.

A significant economy of material resources may be found in reducing unfinished construction, whose above-norm volume for facilities of state capital construction was equal to 15.3 billion rubles in 1983. This means specifically that around 2 million tons of sheet metal, 8 million tons of cement, and 4 million cubic meters of lumber and other materials were taken out of circulation. It has been computed that if in 1984 the level of "unfinished work" will be reduced to 75 percent (with a standard of 72 percent), this will make it possible to free state capital investments in the sum of around 10 billion rubles.

The widespread application of the system of grid planning and management (SPU) is of great importance in implementing savings on material, financial and fuel-energy resources in construction. The basis of this system is the grid schedule. It makes it possible to clearly represent the technological mutual interdependence of construction jobs and to determine the optimal times for start and completion of individual stages of construction as well as the construction of the facility as a whole, the time for delivery of materials, technological equipment, structures and details to the construction site with consideration for their actual reserves at the warehouses and for supplier deliveries. The application of SPU methods makes it possible to concentrate the attention of managers on fulfilling the most important first-order construction jobs and to direct the necessary resources toward these ends. All this helps to determine the available production reserves, to expend the resources carefully and economically, and to reduce the construction times. The introduction of the open flow brigade order is being successfully implemented on the basis of grid schedules. Its application on the basis of grid schedules, as illustrated by the experience of Moscow and Kemerovo builders, leads to a reduction in construction time and facilitates the more rational application of all types of resources.

The reduction of losses and increased economy of material and other resources in construction is currently provided specifically by means of better application and improved accounting for expenditure of electrical and fuel energy. For this purpose, meters and other control-measurement apparatus have been installed at construction sites. Automatic turn-off devices for construction mechanism motors are being widely introduced to keep the machines from idle operation. The working conditions of welding apparatus are being improved, new effective thermoinsulating materials are being used, etc.

The implementation of conditions for economy in the construction industry provides primarily for the rational and thrifty expenditure of cement and metal. At plants manufacturing reinforced concrete products, an important reserve for economy of cement is the application of various chemical additives. Thus, the application of super plasticizers at the Rostokinskiy Reinforced Concrete Products (ZhBI) Plant during the production of reinforced concrete products makes it possible to save 5-8 percent of the cement, while the application of chemical additives at the Tushinskiy DSK-1 Plant yields an economy of up to 6 percent in cement.<sup>13</sup> The effectiveness of this direction in economy depends to a large degree on the quality of cement grades manufactured and on the strict adherence to technological processes of reinforced concrete manufacture. Therefore, it is recommended that the various ZhBI Plants use their own, well tested, super plasticizers and additives.

A great economy in metal may be achieved in the production of reinforced concrete structures thanks to the optimal design of the structures and the application of volume reinforcement carcasses. These measures have yielded an economy in the sum of 2.2 kg of metal per square meter of overall building area at the large-panel house building enterprises of Glavmosstroy.<sup>14</sup> However, the introduction of the indicated leading production methods is often hindered due to the absence of appropriate technological equipment.

An important direction in economy of fuel-energy resources at ZhBI plants is the reduction of the specific energy expenditure for production of one cubic meter of prefabricated reinforced concrete. At leading enterprises in the construction industry, a significant reduction in steam expenditure for production of reinforced concrete is ensured due to the liquidation of leaks through loose connections, optimization of the system of steam feed, and application of effective thermoinsulation and secondary heat. The introduction of a new technology also yields an economy of heat: this is the proving ground method of production of reinforced concrete without steaming.

Large reserves for economy of material and financial resources are also found in improving the quality of project designs for construction sites on the basis of utilizing the latest achievements in scientific-technical progress. The initiative of the collective at the Gidroyekt Institute imeni S. Ya. Zhuk on increasing savings on planned facilities, improving the organization and technology of building heat and power plants, and reducing the expenditure of financial, material and fuel resources is presently being widely promulgated within the project planning organizations. For example, the project planning organizations of the BSSR achieved a reduction in the estimated cost of construction, a savings on material resources, and a reduction of labor expenditures in the amount of 32,000 man-days in 1981 by means of utilizing rational design and overall-planning decisions.<sup>15</sup>

However, the existing order of economic stimulation of the project planning and contracting building organizations still does not provide for their proper interest in reducing the resource consumption of production. Planners and contractors have a weak economic interest in economizing on the expenditures of live and reified labor, since the reduction in resource expenditures leads to a reduction in the volume of commodity building production, and consequently also to a reduction of profits and other indicators. At the present time, an experiment approved by the USSR Gosplan and the USSR Gosstroy is being conducted in the BSSR. In the course of this experiment, a system is being developed to ensure the direct interest of planners and contractors in reducing the expenditure of material and labor resources. This experiment is based on the application of stable prices for completed building production. These prices would not change with application of more modern and economical solutions within the projects. The savings realized from this is distributed as follows: 50 percent is spent on paying bonuses to workers at contracting and project planning organizations and to customers; 25 percent is deducted to the state budget, and the remaining 25 percent goes toward compensating the expenditures of contracting organizations for the introduction of the latest achievements in science and technology.<sup>16</sup> The indicated experiment encompasses all stages of the building cycle. Its implementation not only ensures the material interest

of the participants in this cycle in realizing conditions for economy, but also makes it possible to achieve stability in the estimated cost of construction.

#### FOOTNOTES

1. Cf.: Baybakov, N. "A Firm Step in USSR Economics" *PLANOVoye Khozyaystvo*, 1984, No 2, p 5, 15.
2. Cf.: "Narodnoye khozyaystvo SSSR v 1982" [USSR National Economy in 1982], Moscow, 1983, p 347.
3. Cf.: *EKONOMIKA STROITEL'STVA*, 1983, No 1, p 4.
4. Cf.: Chekalin, A. "Plan and Construction Site," *PRAVDA*, 1982, 8 February, p 2.
5. Cf.: "Narodnoye khozyaystvo SSSR v 1982", Moscow, 1983, p 340.
6. Cf.: Allakhverdyan, D., Podshivalenko, P. "Development of Finance-Credit Relations", *PLANOVoye Khozyaystvo*, 1984, No 3, p 66.
7. Cf.: "Narodnoye khozyaystvo SSSR v 1922-1982" [USSR National Economy in 1922-1982], Moscow, 1982, p 369, 425, 437, 439.
8. Cf.: Bachurin, A. "Course Toward Intensification and Effectiveness of Capital Investments," *PLANOVoye Khozyaystvo*, 1983, No 3, p 8.
9. Cf.: Bachurin, A. *Ibid*, p 8.
10. Cf.: *PRAVDA*, 1983, 14 March, p 2.
11. Cf.: *PRAVDA*, 1983, 14 March, p 2.
12. Cf.: "Narodnoye khozyaystvo SSSR v 1982" p 166, 349.
13. Cf.: Fershter, V. I. "Means of Economy on Cement, Metal and Fuel-Energy Resources in Large-Panel House Building," *EKONOMIKA STROITEL'STVA*, 1982, No 12, p 42.
14. Cf.: *EKONOMIKA STROITEL'STVA*, 1982, No 12, p 43.
15. Cf.: Yevtukh, V. "Means of Saving Resources in Construction," *PLANOVoye Khozyaystvo*, 1983, No 1, p 54.
16. Cf.: *Ibid*, p 59.

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12322

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WALL PANEL OUTPUT IN ESTONIA TO INCREASE

Tallinn SOVETSKAYA ESTONIYA in Russian 27 Nov 84 p 2

[Article: "Political Discussion Day: In the Zone of Questions"]

[Text] What steps are being taken to improve the quality of production at the Tartu House Building Combine? (Unified Political Discussion Day in Pyarnu).

"There is a good basis for posing this question," says ESSR First Deputy Minister of Construction Uno Oskarovich Kiudsoo. "The production of the Tartu DSK [house building combine], which has been called upon to provide construction in the cities and rayons of south Estonia, including in Pyarnu, is still not meeting these requirements. There are many reasons for this. However, the main one is the absence of a shop for manufacturing external wall panels at the DSK. These are supplied by the Narva Building Materials Combine under the ESSR Ministry of the Construction Materials Industry. And, as we know, this production, which is manufactured on a shale-ash base, does not meet GOST [All-Union State Standard] requirements."

The DSK is under reconstruction. Work is being completed on the construction of an individual shop for manufacturing external triple-layer wall panels. The output of such panels for nine-story buildings has already begun. In 1985, when the shop will go into full operation, panels for five-story buildings will also be produced.

We must say that a detailed plan has been developed at the DSK for organizational-technical measures which provide for the future modernization of the enterprise. Already next year the pool of metallic forms will be renovated and improved. The condition of these forms determines the qualitative indicators of the panels. This work has already begun. Greater use will be made of the high-quality wallpaper produced by the Polimer Association. This too plays a significant role.

This same plan of measures provides for strengthening the business ties between the Tallin and the Tartu DSK, as well as for broad exchange of experience and organizational-technical aid given by the Tartu house builders to the Tallin builders.

12322  
CSO: 1821/059

INDUSTRIAL CONSTRUCTION

UPDATE ON CONSTRUCTION OF OIL FIELD SUPPORT FACILITIES

Tallinn SOVETSKAYA ESTONIYA in Russian 29 Nov 84 p 3

[Article: "Estonian Builders in Siberia"]

[Text] On 28 November, a meeting of the governing board for management of the course of construction of facilities in the region of the West Siberian Oil and Gas Complex and the Baykal-Amur Main Rail Line was held at the ESST Council of Ministers under the chairmanship of republic Council of Ministers Deputy Chairman P. Palu. A summary was presented on fulfillment of the tasks for construction of highways and residential houses in this region for the 10 months of 1984.

The board heard the information presented by ESSR Minister of Motor Transport and Highways G. Kruger and by ESSR Minister of Construction Kh. Lumi. The successful work on building facilities in the region was noted.

The rate of housing construction in the settlement of Kogalym is increasing. On 23 November the State Commission here accepted the next-to-last house 60-unit house planned by the annual program for Siberian oil field workers. The builders promise to submit the last residential house for operation ahead of schedule.

The board meeting noted the good work of the ESSR Ministry of Trade, which has provided for continuous supply of Estonian builders in Siberia. The course of construction in the Kichera settlement on the Baykal-Amur Main Line and the construction of agricultural facilities in the Karelian ASSR were also discussed.

Participating in the work of the governing board were section heads of the Estonian Communist Party Central Committee N. Ivanov and V. Il'ves, responsible workers of the ESSR Council of Ministers, and ESSR Ministers.

12322  
CSO: 1821/059

AGRICULTURAL CONSTRUCTION

BOOK ON RURAL CONSTRUCTION MANAGEMENT PROBLEMS REVIEWED

Moscow EKONOMIKA STROITEL'STVA in Russian No 9, Sep 84 pp 69-70

[Review by S. S. Kovalenko, USSR deputy minister of rural construction and RSFSR honored builder, and A. G. Yermichev, deputy chief, USSR Ministry of Rural Construction Technical Main Administration, of book "Sovershenstvovaniye sistemy upravleniya kooperativnym (mezhkolkhozny) podryadnym stroitel'stvom" [Improving the System of Management of Cooperative (Inter-Kolkhoz) Contract Construction] by B. Ya. Ionas and M. F. Lisovskiy, Stroyizdat, Moscow, 1982, 136p]

[Text] In connection with the proposed sharp increase in the volume of construction-installation work in rural construction, questions of intensification of building production, improved application of fixed capital, and identification of additional reserves for increasing its effectiveness are especially significant. Based on an analysis of extensive factual material which was gathered over a rather lengthy period of time, the reviewed book shows the condition, content, structure and specifics of rural, primarily inter-farm, construction organizations, as well as the regularities of their formation. It analyzes the level of available resources and identifies the factors which have a negative influence on construction in rural areas. In accordance with the prospects and tasks for further development of agriculture as presented by the May and November (1982) Plenums of the CPSU Central Committee, the work systematically examines topics of growth of inter-farm building organizations and their structural and territorial shifts, studies the dynamics of indicators on production-economic activity, and illustrates their role in increasing the effectiveness of building production on the farm. As a result of the performed analysis, significant reserves have been identified for increasing the economic potential of inter-farm building organizations, their rational structure in various regions of the country has been determined, and proposals for their further improvement have been given.

The specific proposals of the authors are of great interest. These deal with the further improvement in the organizational structure of the inter-kolkhoz building production. The exemplary structures for management of the production association, the rural building combine and the institute within the make-up of the project design-construction association which have been developed were also of interest.

The work analyzes the experience in developing forms and structures of management as well as the practice of developing management methods within the country's ministries and departments. It also identifies the available reserves with consideration for the specifics and peculiarities of decentralized rural construction and works out a system of measures for utilizing these reserves under which the inter-farm building organizations may achieve the best work indicators.

A definite innovation is the section dealing with the role of the customer in kolkhoz-cooperative construction who finances this construction at the expense of his profits, and in conjunction with the contractor formulates current and long-range plans for construction and also participates in the development of the production base and its management.

Practical workers will find in this book the answers to questions dealing with the order of formulating rayon, oblast, kray and republic inter-farm building organizations in rural areas, rural building combines, and design-construction production associations; the regulation of their rights and responsibilities in the sphere of planning, scientific-technical progress, material-technical provision, personnel, development of the brigade order in decentralized building production, finances, credit, engineering complementation of facilities under construction, and application of computer technology.

The authors note that the improvement in the system of construction management in rural areas makes it possible to bring the management apparatus closer to production and to create conditions for a two-step and three-step structure of management. At the same time, the principle of creating inter-farm building organizations must be, in their opinion, strictly regulated by the administrative-territorial division of the country. As a rule, there should be one design-construction production association per oblast, kray or republic, which under conditions of kolkhoz-cooperative ownership is of significant importance.

In connection with the fact that territorial decentralization is a peculiarity of rural construction, the proposal presented by the authors stating that the decentralization of management functions be determined depending on the specific work conditions with consideration for the organizational structure of the association, its sphere of activity, and the scope and territorial conditions of production seems to be valid.

Quite correctly, the authors have devoted considerable attention to unresolved questions which hinder the further development of agricultural building production. The reader will find materials dealing with the development of the method of continuous planning and flow-line construction, on creating a unified customer and planner, as well as a single contracting building organization for a region.

The measures for improving the level of technical-economic substantiation and plan balance which are examined in the book have principle importance. Specifically, in compiling the annual and five-year plans, the questions of development of the production base of builders depending on the proposed volumes of construction-installation work are resolved in conjunction with the customer.



The analysis of the practice of organizing cost accounting in inter-farm construction has made it possible to present a number of proposals for its improvement with consideration for the characteristic specifics of the sector.

Taking into consideration the territorial specifics of rural building production, the authors have analyzed the theory and practice of current economic methods of building production management in rural areas and have defined the basic moments for improving these methods directed at improving their effectiveness.

The book illuminates the most important theoretical and practical questions dealing with the interaction of production system elements in rural construction. It also outlines the means for increasing the concentration, degree of cooperation, intensification of specialization and combine formation in inter-farm building production.

The proposals which the authors present on further improving technical specialization in territorial building associations on the farm are also of great scientific and practical interest.

Nevertheless, in our opinion, it would have been helpful to present a more complete explanation of the factors determining the development of technological specialization and to identify those factors which directly determine the sources of formation of effect and additional expenditures associated with the growth of [this technological specialization] in inter-farm construction.

Since the book is devoted to a problem which has not yet been sufficiently studied, it does not reflect all aspects of this problem, and certain conclusions and recommendations are debatable. In our opinion, the book gives insufficient attention to questions of territorial organization of rural construction and mutual ties between the low and mid-level sectors of management.

Since rural construction is performed not only by state and kolkhoz-cooperative organizations, but also by state-cooperative organizations as well, it would have been helpful to deal with the latter in greater detail. Certain questions are presented in the book only as formulations.

The book also does not devote enough attention to the joint work of state and inter-kolkhoz building organizations within the make-up of the construction ministry (Ministries of Construction of the Tajik, Turkmen and Georgian SSR). Nor does it devote enough attention to the development of the base for state and inter-kolkhoz building organizations of the country according to a unified plan.

On the whole, the work is characterized by innovation in the formulation and solution of the questions which it examines. Of course, not all these questions are resolved at a uniform level and not all the conclusions and proposals made by the authors are irrefutable. A number of positions presented in the book require further study, clarification and specification. However, the illumination of the formulated problems and the solutions proposed by the authors have not only a theoretical, but also an important practical significance.

The application of the recommendations proposed in this book will facilitate the improved organization of rural building production and the solution of its organizational problems. It would seem that a book which draws theoretically substantiated conclusions and comprehensively generalizes extensive specific material would be of interest to workers in the appropriate sector, to project design and scientific-research organizations, as well as to all those who are interested in the problem of formulation and development of design-construction production associations on the farm. The work will play a positive role in further improving the economic management mechanism of rural building production.

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## HOUSING CONSTRUCTION

### BUILDERS HELD RESPONSIBLE FOR LOW-QUALITY HOUSING

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 3 Nov 84 p 2

[Article by Georgiy Arkad'yevich Karavayev, USSR minister of construction :  
"Don't Look for Excuses"]

[Text] The discussion about the liability of builders for the quality of their work, which they began in their letter which was published in PRAVDA, the brigade leaders from a number of construction projects, and the decree, based on the letter, which was adopted by the CPSU Central Committee, all bind construction and installation collectives to perform their work with with extreme exactingness and strictness. This is the primary means to sharply improve the quality of all types of construction, and residential construction in particular.

An examination of the complaints from newly constructed settlements shows that most of the dissatisfaction with the new quarters is caused by their finish work. Doors and window frames hung out of alignment or not adjusted, wallpaper hastily pasted up, floors carelessly laid, bathroom fixtures haphazardly installed, and so on. And all this is indisputably the fault of the builders. In the ministry one often has to listen to excuses from some supervisors: and what, they say, can we do, if the domestic plumbing fixtures (tubs, flush tanks, wash basins, toilet bowls) were, both in outward appearance, and in operation, far from being in the condition the new settlements want to see? And that's just how it is. But, it is asked, are just any products which are put out by the manufacturers accepted without a murmur? And why don't they, in the established order of things, call the suppliers of inferior products and equipment to account?

I'm not asking these questions by chance. In a number of cases, the answers to them consist in the indifference and lack of initiative of those who are supposed to look after the honor of the collective, and in the fact that the work they have done neither rouses censure nor gladdens the heart.

Recently a letter came to be examined in the ministry. It came from Saratov from Yu. Romanov, the Party bureau secretary of the Glavprivolzhskstroy [Main Administration for Volga Areas Construction] Finishing Work Trust. Among a number of other problems he mentioned the low quality of finishing materials which are showing up at the Trust. About the time the facts began to be looked

into, it came to light that neither comrade Romanov himself, nor Trust Administrator Yu. Kovalev, nor A. Ishchenko, chief of the Main Administration for Material and Technical Supply, had lifted a finger to in any way influence the suppliers or to establish business contacts with them.

What does this incident reveal? It reveals, in the first place, the indifference of the supervisory employees to their duties. And moreover, it bespeaks an habitual passing of problems on upward; as they say, "Let George do it". We have assessed the actions of the above-named employees accordingly.

However, and in no wise diminishing the factor of increased responsibility of persons carrying out their assigned tasks, I want to emphasize that the cardinal means for improving the quality of work is the raising, by all means possible, of the level of industrialization of construction, and of the plant readiness of prefabricated structures and components. As we know, the most progressive method for organizing residential construction is on the basis of the house-building combines who prepare the entire collection of prefabricated structures and house components themselves, and install them themselves. There are 63 of these enterprises in our ministry. They have all changed over to producing components and erecting houses according to new standard designs. This amounts to over 9.5 million square meters of total living space, or 83 percent of the ministry's available house-building production capacities. Here, 47 combines are producing the so-called new series of block-sections, which have an improved floor plan for the apartments in 9-12-floor residential buildings.

For the last few years, we have been consolidating the house-building combines. At present, the average capacity of each of the combines amounts to 130,000 square meters. In 1970, this indicator was less than 85,000 m<sup>2</sup>. At most of the combines, conveyors lines are in operation as well as machines which continuously produce components. Progressive reinforcement for bearing and inside wall panels have been introduced, thanks to which up to 7,500 tons of steel are saved yearly. At 40 of the enterprises, stamped (rather than welded) inserts are being used, which has permitted a 2-fold reduction in outlays of the metal used for these purposes. And 10 of the combines are already producing stamped metallic door frames, which last much longer than those made of wood.

Year before last, at the Kalinin demonstration model support house-building combine, a so-called reel-type conveyor line, which is used in the manufacture of internal house walls, was introduced. Now these lines are being acquired at five enterprises, and 22 lines will be in use by the end of 1987.

I'm writing about this in detail, because part of high house-building industrialization includes strict technological and production discipline. And that is exactly where the quality of a construction project begins.

Measures for intensifying production and technological discipline have been taken in all of the ministry's subdivisions. In particular, the requirements for the production of door units, window sashes and partition panels have been



made more strict in the construction industry enterprises. Step-by-step operation checking has been increased during installation and finishing work operations of buildings. All this has already had a perceptible effect on workers' attitudes to their jobs.

But not to justify those oversights in construction quality which have been, and even today are being encountered, and not from a desire to push the problem aside, I am forced, all the same, to say that at construction projects, as has previously been the case regarding present-day finishing materials, the situation is not good, and in particular I refer to carpeting for the floors, high quality linoleum, good facing slabs, plumbing fixtures, and durable, attractively-toned interior and exterior paints. But synthetic finishing films and plastics are still only used in experimental construction. This complaint is directed to the Union construction materials industry ministries and the chemical industry ministries.

We live in a time when the problem of the quality of any industrially manufactured product is so acute that none of us has the right to not think of ways to improve it. All the more so, when we are talking about the quality of people's habitation--their daily living environment.

It appears that in this connection local agencies could render invaluable aid to the builders. They have every opportunity, on a daily basis, to monitor the progress of the combined measures outlined by each construction subdivision for improving the quality of construction work, to study and analyse the local state of affairs in more depth, and to bring about closer coordination of the organizational, mass-political and ideological work with the solution of the organizational, and production and technical tasks.

As an example of a place where such selfless labor is being done, I would like to name the Georgian SSR. There, at the beginning of this year, a special decree of the Georgian Communist Party Central Committee and the republican Council of Ministers was adopted regarding measures for the improvement of quality in construction. And some time later a meeting of the party- and industrial aktiv of republican builders was held and given over to this problem. During the meeting it was emphasized that the party organizations must occupy themselves fully with the questions of introducing integrated control systems to monitor the quality of construction output and construction and installation operations. Incoming, step-by-step, acceptance testing, inspection, metrological, laboratory and geodesic control need to be organized everywhere, and in all construction industry enterprises and at the construction sites themselves, and training operations need to be intensified among the construction workers to enhance their professional training and their production and labor discipline.

And places where these measures are not simply given lip service, but are put into effect, success will unfailingly be achieved. And today, in fact, this actually exists in our practice, where not individual houses, but entire residential blocks are given high marks. Thus, in due course, the Ladzinay microrayon construction (in progress) in Vilnius, which was done by builders

from our ministry, has been awarded the Lenin Prize. Last year, for developing the first phase of the city of Kirishi, in the Leningrad Oblast, and the Kalnechyay residential area in Kaunas, the builders and designers were awarded a bonus from the USSR Council of Ministers. These areas meet the most up-to-date requirements for urban development, and the residences within them meet the exacting demands of new settlements. And everyone should align themselves right on these landmarks. Only through our combined efforts, and, of course, those of the builders (and we understand this quite well), can the problems which have been set for improving the quality of construction work be solved.

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CONSTRUCTION MACHINERY AND EQUIPMENT

MINISTRY OFFICIAL ON NEW TECHNOLOGY IN FAR EAST CONSTRUCTION

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[Article by Yu. Drobyazgo, first deputy minister of constructions in Far East and Transbaykal regions: "Introducing Scientific-Technical Achievements Into Construction"]

[Text] The Far East is the largest of all the economic regions of the country. It occupies over 6 million square kilometers, which comprises over one-fourth the territory of our state. The natural resources of the Far East are truly innumerable--coal, gas, nonferrous metals, timber, energy from rivers, winds, tides and thermal waters... In the forests, 30-35 percent of all the furs obtained in the country are procured. The fish catch in the aquatoria of the seas and oceans has reached 40 percent of the all-union figure.

In accordance with the economic strategy of the party defined by the 26th CPSU Congress and subsequent Plenums of the CPSU Central Committee, the Far East must be developed even more intensively. This course is successfully being implemented. New cities and settlements are growing and rapidly turning into major industrial centers. A brilliant example of this is Komsomolsk-on-Amur, around which a large economic region has been formed and the satellite cities of Amursk and Solnechnyy have arisen. An eloquent testimony to the integrated approach in solving complex economic problems in the region is the program of assimilating the BAM [Baykal-Amur Main Line] zone, the pivotal point of which has become the construction of the Baykal-Amur Main Railroad Line, which has been called the construction site of the century by the Soviet people.

The Far Eastern region has great prospects for the future. However, its potential resources are difficult to extract, since it is also one of the most complex regions in terms of natural-climatic conditions. The taiga, tundra, volcanoes, hurricane winds, severe frosts; 8/10 of the territory comprised of permafrost; difficult accessibility, low level of development and sparse population, lack of roads--these are the peculiarities of the Far East. Here the price is higher for a ton-kilometer of auto transport, for a cubic meter of placed cement, and for a square meter of housing. Improvements in these areas are 2-3 times more expensive in these areas than in the central regions of the country.

Developing the riches of the Far East requires great expenditures and courageous labor. Our state is making vast allocations, and the workers are admirably bringing to life the program for intensive economic development of this region.

At the present time, the integrated program "Dal'niy Vostok" [Far East], which is intended for the period through the year 2000, has been developed and is being realized. Deposits of nonferrous metals are being energetically developed, provisions are being made for extracting oil and gas on the shelf of Sakhalin Island and for developing a highly effective timber industry complex. Research is being conducted and projects are being realized on the application of the geothermal resources of Kamchatka. The Pauzhetskiy Geothermal Power Station is already in operation, and there are plans for building an even larger station--the Mutnovskiy GRES --in the 12th Five-Year Plan.

The integrated program places accentuated attention on increasing labor productivity. The Far Easterners are still lagging behind the all-union level in this indicator, which is associated with the peculiarities of sectorial and territorial development of this region's economy and with the greater application of manual labor as compared with other regions of the country.

Considering the extremal conditions of the Far East, the program places particular stress on accelerating scientific-technical progress, which determines to a significant degree the production growth rates and the level of labor productivity. The technological re-tooling of production has taken a course toward implementing a labor-saving policy based on the principle of "more technology--fewer people."

A large volume of work on developing the region's economy and on its social and cultural transformation is being done by the collectives of the Ministry of Construction in the rayons of the Far East and Transbaykal. In the 3 years of the current five-year plan, they have performed almost 4.4 billion rubles worth of construction-installation work. The average annual increase in volume of this work has comprised 6.5 percent. Over 200 major industrial facilities have been submitted for operation.

Capacities at the Dal'energomash (Khabarovsk), and Buryatfermmash (Ulan-Ude) Plants, at the Yaroslav COK [Mining-Enriching Combine] and the Pavlovskiy-2 open pit mine in Primorskiy Kray, at the Komsomol'sk Sulfuric Acid Plant in Komsomolsk-on-Amur, at the Khabarovsk Silicate Masonry Materials Plant have become operational. Turbines have been built at the Mayskiy GRES in Sovetskaya Gavan, the Kamchatka Poultry Farm has been placed into operation, etc.

In 1984, implementing the resolution of the CPSU Central Committee and the USSR Council of Ministers entitled "On Improving Planning, Organization and Management of Capital Construction," Minvostokstroy [Ministry of Construction in Far Eastern Regions] has achieved a series of positive improvements. An improvement in the main direction of activity--the operational introduction of facilities--has been achieved. As a result of improved organization of work at start-up construction sites, the plan assignment for the 9 months of 1984 has been overfulfilled. Instead of the 40 capacities and facilities within the nomenclature of the national economic plan which were to be introduced into operation, 45 were actually submitted. Among these were capacities at the Dal'sel'mash Plant in Birobidzhan and the Khorskiy Biochemical Plant in Khabarovsk Kray, as well as capacities at the Production Organization Petropavlovskaya sudoverf' imeni V. I. Lenin in Petropavlovsk-Kamchatsk, at the Vladivostokskiy Fish



Combine and the bread combine in the city of Spassk-Dal'niy in Primorskiy Kray.

The amount of contract work performed was 3.5 percent higher than that for the same period in 1983. The assignment for growth of labor productivity with consideration for the over-plan 1 percent as adopted by socialist responsibilities has been fulfilled, as has been the assignment for reduction in the cost of construction-installation work.

Minvostokstroy has developed and ratified a program according to which at the present time, integrated quality control systems are being introduced at subordinate construction organizations and at industrial enterprises. For the purpose of increasing the material interests of all participants in construction in achieving a high end result and in increasing the level of engineering preparation for production, the Ministry, working in conjunction with the USSR Goskomtrud [State Labor Committee] is conducting an experiment on creating construction cost accounting brigades with inclusion of line and other ITR [engineering-technical workers]. Such brigades have been created at all the main construction administrations. Glavvladivostokstroy [Construction in Vladivostok Main Administration] and Glavdal'stroi [Construction in Far East Main Administration] have the most such brigades.

For 1985 the institutes subordinate to Minvostokstroy have developed thematic plan-measures for the application of technical decisions in plans which would provide for the widespread application of leading domestic and foreign experience and improvement in project quality.

Leading collectives have come forth with initiative on developing socialist competition for accelerated housing construction under the slogan: "For Residential Construction--A Fast Pace." This patriotic endeavor has been approved by the Minvostokstroy governing board and the Presidium of the Central Committee on Workers in Construction and Building Materials Industry. Target competition has presently been organized at residential construction sites, with all the ministry's main construction administrations participating. The best ones at facilities of this type are the collectives of the Vladivostok and Sakhalin House Building Combines.

There have been some positive changes in the plan-economic work of Minvostokstroy in the current five-year plan. The transition of contracting construction-installation organizations to planning commodity building production has been completed. Accounting between customers and contractors for fully completed and submitted facilities, lines and start-up complexes has been introduced. Project planning institutes have been changed over to accounting for projects which have been completed and accepted by the customer. Industrial enterprises have changed over to planning and evaluation of activity according to the indicator of standard net production. Work has been concluded on the compilation of passports for enterprises in the construction industry and for construction-installation organizations with accounting for their capacities for each plan year. This is necessary in the development of five-year and annual tasks.

In the plans for economic and social development for the next five-year plan, the Ministry is providing for the application of new indicators and long-

term standards. Among them are those such as planning the limit of material expenditures, the number of workers and personnel; wage standards per ruble of volume of construction-installation and project planning work; stable norms for the formation of economic incentive funds and for reduction of manual labor. Multi-aspectual work is being performed on developing cost accounting.

A general scheme is envisioned for management of construction, which will develop a more effective system of management in zones of the ministry's activity.

In order to implement large-scale construction in regions which are considerably removed from the location of construction organizations, the creation of mobile construction-installation subdivisions is envisioned. In connection with this, the duty-watch method of construction will be used. The question of experimental construction of production facilities and housing with submission "under key" is being studied.

In the current five-year plan, the efficiency of the work performed by Minvostokstroy's collectives is steadily increasing. Every year the ministry increases the volume of construction-installation work performed by its own efforts by an average of over 50 million rubles. The greatest growth is provided by collectives working in Kamchatka, Sakhalin and Magadan Oblast.

The number of workers employed for fulfilling a work volume in the sum of 1 million rubles is decreasing. While in 1980, 95 people were required to perform such a volume of work, in 1984 this figure was reduced to 88. Glav-amurstroy (14 people) and Glavburiyatstroy (24 people) achieved the best indicators in reducing the number of workers.

The relative share of unfinished production and the cost of construction-installation work is also being reduced. The implementation of start-up programs has improved. The relative share of construction sites which do not meet the planned times for operational introduction is declining, while that for sites being submitted for operation ahead of schedule is increasing. For example, in 1983 there were 6 such facilities, and in 1984--22. In 1984, the refrigeration unit at the Vladivostokskiy Fish Combine, a vegetable storage facility in the city of Gornozavodsk in Sakhalin Oblast, a footwear enterprise in Chita, and a purification structure at the Amursel'mash Plant in Amur Oblast were submitted for operation 3 months ahead of schedule.

Today, due to all the factors in accelerating construction, Minvostokstroy is building facilities almost 15 percent faster than the first year of the current five-year plan. In 1983, thanks to the application of the brigade contract order in residential construction, the time for building houses was reduced by an overall total of 3,800 days, or 4.1 percent. At the same time, the over-plan reduction in expenditures for the production of construction-installation work has comprised 6.7 million rubles, i.e., 1.6 percent. In 1984 the brigade order ensured the ahead-of-schedule submission of facilities at the Petropavlovskaya sudoverf' Production Organization imeni V. I. Lenin, at the Sakhalinzhelezobeton Plant, and at the Solnechnyy GOK in Khabarovsk Kray.

The application of volume-block installation is significantly accelerating the course of construction. For example, such installation of the roof at the Far Eastern Metallurgical Plant in Komsomolsk-on-Amur made it possible to reduce the duration of work to one-half the former time.

Minvostokstroy is developing measures to stimulate the material interests of the construction organizations in consolidating the labor collectives and in increasing their capacity, economic effectiveness and profitability. A broad complex of measures has been outlined for bringing progressive standards to the subordinate construction organizations and enterprises on types of work, expenditures of labor, raw goods and materials, and fuel-energy resources.

At the present time, an integrated automated control system--"ASU-Minvostokstroy"--is being developed within the ministry. Its first phase will go into operation in 1985.

Individual subsystems and complexes of the first phase of "ASU-Minvostokstroy" are already in operation at the ministry level. Specifically, a subsystem for collection and automated processing of information on the course of construction for vital national economic facilities--the "AIS-OVO"--is already functioning. It effectively controls over 100 facilities. The computations on need for basic materials are performed in accordance with "ASU-bukhuchet" [Automated Control System-Bookkeeping and Accounting]. There is a system for collecting and automated processing of information on plans for improving the technical level of construction and for introducing achievements in science and technology--"ASU-NT", as well as a system for formulating an annual program of construction-installation work--"ASU-plan SMR".

Computer centers equipped with 11 electronic computers are functioning at 6 of the territorial glavks [main administrations]. The degree of equipment with means of computer technology for project planning institutes is increasing. Here the level of project planning automation has reached 12.5 percent in 1984. There are plans to create an information-computer center for collective use in Khabarovsk Kray. A Main Computer Center for collective use is being created to serve Minvostokstroy and the USSR Minstroy [Ministry of Construction].

The organic combination of the socialist system of economic management with the achievements of the scientific-technical revolution is our primary concern, noted CPSU Central Committee Secretary General and Chairman of the USSR Supreme Soviet Presidium K. U. Chernenko at the April (1984) Plenum of the CPSU Central Committee.

In the 3 years of the current five-year plan, the level of introduction of scientific-technical achievements at Minvostokstroy has more than doubled. The volume of application of progressive designs and materials is increasing, the degree of work mechanization is intensifying, and the application of effective methods in the organization and technology of building production is expanding. As a result, there have been notable shifts in the technical level of the latter. The volume of fully prefabricated construction has increased by 24 percent and the introduction of residential large-panel and volume-block houses--by 12 percent; the application of lightweight metallic



structures has increased several times over, as has the application of aluminum structures and profiled steel sheeting.

The Minvostokstroy collectives have begun utilizing the achievements of scientific-technical progress and the experience of the country's leading construction sites on a larger scale and with greater return. The application of monolith structures with use of progressive types of casings has increased by 44 percent, and with application of highly productive concrete pumping trucks and concrete mixers--by 60 percent. The application of asbestos cement sheets in the installation of partitions and enclosure structures has increased by almost 1.5 times, the application of profiled steel sheeting--by 20 percent, and the manufacture of volume sanitary-technical units--by 10 percent.

The effect of using the brigade order is also increasing. This method is used to fulfill around 45 percent of the construction-installation work. The number of piece workers covered by the lump wage payment system has risen to almost 70 percent.

The scope of application of the unit method of planning, organization and management of construction is expanding in the construction of large and structurally complex facilities. Today around 25 percent of the volume of industrial construction is being performed on the basis of this method. In 1984 the unit method in combination with the open contract order was used to build 14 major industrial facilities. Among these was the Far Eastern Metallurgical Plant, the Dalnerechensk Timber Processing Combine, the Lesozavodskiy Hog Complex, and the Yakutsk DSP [house building combine].

In the sphere of increasing the level of industrialization of industrial construction, a course has been taken toward increasing the application of fully prefabricated framework buildings, whose portion will be brought up to 85 percent by 1990. This growth will be ensured by means of increasing the output of complement reinforced concrete structures and expanding the application of lightweight metallic structures supplied in complete sets. Considering the high effectiveness of utilizing the latter, Minvostokstroy is planning to increase the volume of their application from 200,000 square meters in 1984 to 1 million square meters in 1990.

The application of progressive design schemes with utilization of prestressed covering slabs "per span" and structures made of high strength concretes has been defined as the primary direction in the construction of industrial buildings with reinforced concrete carcasses.

The combined application of building schemes with reinforced concrete carcass and lightweight enclosure structures is another progressive approach to the construction of industrial buildings under the conditions of this region. For this purpose, Minvostokstroy is organizing local production of enclosure structures based on effective insulators--foam polystyrene, high rigidity fiberboard, and plastiprene--in Khabarovsk Kray, Yakutia, Chita Oblast, and Kamchatka in the 12th Five-Year Plan.

Provision has been made for increasing the degree of prefabrication of auxiliary buildings and structures and built-in accommodations. For this purpose,



enterprises for the production of industrial partitions--gypsum concrete, gypsum-cardboard, asbestos-slate and others delivered in a set with their attachment elements--will be created within each territorial glavk. Specifically, a plant manufacturing gypsum-cardboard sheets of improved quality will be built in Khabarovsk Kray, as well as an enterprise for the production of assembly parts and elements of built-in accommodations made from thin sheet steel. Preparations are being made for organization of products manufactured from plastic.

In agricultural production construction, a course is being set toward wide-scale application of progressive variants of building carcasses with application of lightweight structures of complete plant readiness and included in the make-up of the Unified Technical Conditions for Planning Agricultural Buildings. Coordinated with the USSR Minsel'khoz [Ministry of Agriculture] and the USSR Gosstroy [State Committee on Construction Affairs] for application at Minvostokstroy construction sites, these design decisions make it possible to save 30 percent of the concrete and 25 percent of the metal as compared with traditional industrial designs, and to reduce the labor consumption for installation by 15 percent.

The intensive mastery of the Far Eastern region is associated with the realization of an extensive program of housing and cultural-domestic construction. Under the severe conditions of the Far East, improved domestic conditions take on particular social significance, since today the region's provision with housing is somewhat lower than in the RSFSR.

In the 3 years of the current five-year plan, the Minvostokstroy organizations have built over 5 million square meters of housing, a large number of schools and pre-school institutions, as well as public health, cultural and domestic facilities. Every year the volume of work fulfilled at these construction sites is increasing and the quality of facilities introduced into operation is improving. The collectives have been awarded the Prize of the USSR Council of Ministers for building a number of civil buildings of industrial design in Kamchatka, a residential section in Vladivostok, and a theatre in Khabarovsk.

The primary direction in the sphere of residential-civil construction is the realization of the target comprehensive long-term program on "Large-Panel House Building." In the current five-year plan, the portion of large-panel residential construction in the zone of activity of Minvostokstroy has reached 85 percent. Large house-building combines are being built in Yakutsk, Komsomolsk-on Amur, Yuzhno-Sakhalinsk, and Sovetskaya Gavan.

Working in conjunction with Gosgrazhdanstroy [State Committee for State Construction and Architecture], Minvostokstroy is implementing a long-term (up to 1990) program for the development and introduction of progressive technical decisions into large-panel house building which would ensure an improvement in the technical-economic indicators and an increase in the effectiveness and quality of residential-civil construction. The realization of this program will make it possible to reduce the labor consumption of work by 15 percent and the metal expenditure by 10 percent, and to save about 5 percent on energy resources.

As an example of the practical implementation of this program, we may mention the prefabricated unit-conveyer line for the production of covering slabs and inside walls built at the Vladivostok Large-Panel House Building Plant No 35. This is the first such facility in the Far East. The line was developed by specialists at the Vladivostok DSK and the Orgtekhstroy Trust of Glavvladivostostroy [Construction in Vladivostok Main Administration]. It is 1.5 times more productive than traditional prefabricated unit lines, while the expenditure of thermal energy per cubic meter of reinforced concrete is only half that of the traditional method. Such lines will also be installed at other enterprises for large-panel house building.

Provisions are being made for transferring DSKs to the output of houses according to new standard projects in the 12th Five-Year Plan, for implementing the mass introduction of industrial non-rolled roofs, as well as for organizing the production of triple laminate panels with effective insulators for the northern zones and single-layer panels made of keramzit perlite concrete for other regions.

Two prospective series of houses have been selected as the basis for large-panel house building. These most fully correspond to the natural-climatic conditions of the Far East and are the following: Series 97--for plants with capacity of over 100,000 square meters of housing per year and Series "Mobil" (KievZNIIEP [Kiev Zonal Scientific-Research and Design Institute for Standard and Experimental Planning])--for enterprises of small capacity. Almost all the ministry's DSKs are currently being built with consideration for the introduction of these series.

Much attention is being given to the formulation of the appearance of Far Eastern cities and to increasing the degree of architectural expressiveness of the construction. Specific measures have been outlined and are being realized. For example, Primorskiy Kray is being built up with houses of improved series (83). Series 97 houses will soon be approved for construction in Khabarovsk Kray, Buryatiya, Chita, Amur and Sakhalin Oblasts. These buildings are intended for standard and seismic (up to 8 points) conditions. They will be convenient for the residents. The apartments are planned in accordance with demographic requirements according to the principle of "functional zoning."

Individual projects for residential houses up to 16 stories in height and projects for built-in and adjoining buildings for trade and domestic enterprises have also been developed for our region. The new projects are replacing the old ones en masse. Today they are being used in building 2/3 of all residential housing in the region.

Working in conjunction with the USSR Gosstroy institutes, Minvostokstroy is conducting scientific-research, project planning and preliminary work on organizing the production of new types of industrial residential houses made of non-concrete materials for construction in regions with difficult accessibility and in rural areas. The first capacities for the manufacture of such container-type buildings will be placed into operation in 1987 in Khabarovsk. For the manufacture of prefabricated large-panel buildings of the "Mobil" series they have already been created in 1984 in Nikolayevsk-on-Amur.

The volume of industrial construction in rural areas is increasing. It is being implemented by most of the ministry's DSKs. A significant event in rural construction has become the experimental development of a micro-rayon in the village of Dmitriyevka in Chernigovskiy Rayon of Primorskiy Kray. Here, 30 two- and one-story houses of various types have been built, which differ by their architecture, planning, finish and materials.

Considering the low level of prefabrication of social-cultural-domestic facilities in the region, Minvostokstroy and the USSR Gosstroy have adopted the decision to change over to the output of the more economic interspecific frame-panel series 1.020 and the large-panel series 1.090. In the 12th Five-Year Plan, the ministry's enterprises will begin manufacturing designs of this series for non-seismic and seismic regions and for regions with permafrost soils.

The installation of bases and foundations is particularly complex for construction in permafrost and seismic regions. The cost of these structures is over 30 percent of the overall cost of the building, and the construction time is much longer than in the central areas. In connection with this, Minvostokstroy is implementing a target program directed at developing such construction.

The application of piling foundations is being expanded for standard soil conditions, particularly with the application of progressive types of pilings: prestressed without cross reinforcement, column-piles, bore-driven piles, compound piles, etc. By the year 2000 the volume of their application will be increased by 3.6 times. This will make it possible to reduce the cost of building foundations by 30 percent and the labor consumption of operations by 25 percent, and to build the "zero cycles" at a much faster rate.

Means are being sought for increasing the effectiveness of building foundations in permafrost soils. In connection with this, the experiment being conducted in Yakutsk on building foundations on alluvial soils is of some interest. The method was developed by ZabaykalpromstroyNIIproyekt, NIIOSP [Scientific-Research Institute on Foundations and Underground Structures] imeni N. M. Gersevanov, and LenZNIEP [Leningrad Zonal Scientific-Research and Design Institute for Standard and Experimental Planning]. It is much cheaper than the traditional method and many times less labor consumptive, yet with increased reliability.

The long-term (to 1990) target program entitled "Porous Fillers and Effective Slab Insulators" is being realized. It provides for the solution of such important problems as improving the thermal protection of buildings and structures, reducing the volume weight of enclosure structures, and accelerated development of a base for effective building materials. Provision has been made for performing a series of geological survey and scientific-research works for the purpose of more widely utilizing natural porous and lightweight fillers in construction.



The decision has been made to create enterprises for extracting and processing perlite from deposits in Chita Oblast and Primorskiy Kray. There are joint plans with the RSFSR Minstroyaterial [Ministry of the Building Materials Industry] for per-unit construction of an enterprise for mining and processing volcanic slag in Kamchatka; with the RSFSR Mingeo [Ministry of Geology] for a mineralogical survey plan for the period 1984-1990. A series of flow lines for obtaining lightweight and slab insulation material will be developed and installed in 1985-1990 in conjunction with the USSR Gosstroy.

The CPSU Central Committee and the USSR Council of Ministers adopted a resolution in 1983 entitled "On Measures for Accelerating Scientific-Technical Progress in the National Economy." This document is a clear program for creative activity by scientists and specialists for the development and renovation of production potential. Much is being done and much is planned in this regard within Minvostokstroy.

At the present time, a comprehensive program of automation of building production for 1984-1985 and for the 12th Five-Year Plan is being realized. This program provides for three basic directions: the introduction of robots and handlers at enterprises of the construction industry and at repair-mechanical plants; the automation of concrete and mortar preparation; the application of automated systems on means of building technology.

Already in 1984, the first batch of robots and handlers went into operation at enterprises within the construction industry. Among these were means for performing lifting-transport operations, loading of presses stamping out inset parts, and means of equipment for production of slag-concrete stone.

A comprehensive solution to the problem of monolith concreting is being implemented at the ministry according to the long-term target program "Monolit." By 1990, 75 percent of the concrete mixing units will be transferred over to automatic control. The volume of concrete placement in structures with the application of progressive types of casings will be brought up to 95 percent, and with application of concrete pump trucks and concrete mixer trucks--to 40 percent. This will make it possible to increase labor productivity on concreting operations by 15-20 percent, to improve their quality, and to reduce the expenditure of materials by 7-10 percent.

A most important component part of technical progress in construction is integrated mechanization. The operations performed by the integrated-mechanized method within Minvostokstroy have increased in the 3 years of the five-year plan: earthwork operations--by 45 percent; installation of building structures--by 24 percent; concreting operations--by 23 percent, and plastering work--by 21 percent. The level of machine-worker ratio has increased by 25 percent, and power-worker ratio--by 9 percent. The output of construction machines and mechanisms has increased by 6-17 percent. All this has ultimately ensured the planned growth of labor productivity due to mechanization.

The high effectiveness of technology application is facilitated by its concentration in specialized trusts and mechanization administrations. Today the level of such concentration in Minvostokstroy comprises around 92 percent.



Practical experience has shown that technology works with greater return in specialized subdivisions as compared with general construction trusts. Thus, the degree of technical preparedness is 12-20 percent higher and the output is 41-55 percent higher, while the average daily application is 18-22 percent higher.

We are trying to raise the level of mechanization primarily on jobs where the portion of manual labor is still high and on labor consumptive processes. For example, the powerful D-355D bulldozers equipped with soil cultivators are used in excavation of rocky, frozen and permafrost soils. As a result, there is no longer a need for heating the soil, which has yielded a great savings in fuel expenditure. Over 400 service personnel have been liberated, labor productivity has increased notable and the pace and quality of work have improved.

Intensive construction in the regions of the Far East and the Transbaykal region determines a non-traditional approach to the development of special technology, particularly in its "northern" version. Minstroydormash [Ministry of Construction, Road and Municipal Machine Building] meets only 20 percent of these needs, in connection with which a large reserve for increasing labor productivity remains unused. Thus, in the 3 years of the current five-year plan, the pool of bulldozers in the "northern" variant has increased by 13 percent, and their output--by 17 percent.

The ministry has taken measures for equipping its subdivisions with highly effective technology. Working in conjunction with GKNT [USSR Council of Ministers State Committee on Science and Technology] on the basis of cooperative deliveries with certain foreign companies, the output of this technology is being mastered at our own enterprises. Individual examples of such technology were exhibited at the Moscow International Exhibit "Stroyekonomiya-84." These are new modifications of boring and boring-crane machines mounted on automobile chasses of various makes. Their application has made it possible to accelerate the building of foundations by 2-3 times. The series manufacture of this technology will begin in 1985.

The organization of production of mobile boring-crane installations on automobile chasses for drilling holes up to 20m deep and up to 1200mm in diameter and capable of operating at low temperatures is the order of the day.

In the 11th Five-Year Plan Minvostokstroy mastered the output of 15 new types of building machines and means of mechanizations and organized the manufacture of standard complements for painting, plastering, concreting and welding operations.

The upcoming five-year plan calls for the introduction into production of new prospective models of suspended hydraulic equipment for excavators used for breaking up soil and rock by the "introduced wedge" method; the introduction of mechanized scissors-type trestles, cranes with telescoping boom and load capacity of 20-25 tons on the KamAZ automobile chassis, and other means.

Scientific-technical progress is the universal lever for elevating production. The sphere of application of effective innovations is growing, and the search for new means and methods of accelerating scientific-technical progress is expanding. The ministry's plans provide for the introduction of a highly effective insulator--plastiprene, progressive modifications of designs for "span" reinforced concrete covering slabs, application of entrainment ash for preparing concrete and mortar mixtures, application of various additives made from natural materials of volcanic origin for making concrete and mortar, etc.

For purposes of propaganda and widespread introduction of leading experience, the latest achievements in science and technology in the sphere of organization and technology of building production, and increasing its culture, Minvostokstroy has organized the exemplary-exhibit construction of the Far Eastern Metallurgical Plant in Komsomolsk-on-Amur. It is being implemented on the basis of creative scientific-technical cooperation with 25 project design, design-technological and scientific-research institutes.

A number of design and architectural-planning decisions have been adopted in the plant's project which meet the current requirements in construction of large industrial complexes. The planning and construction of the enterprise is being performed by the unit method, which ensures parallel work on the planning, preparation for production and construction of first-priority facilities. The residential houses, social-cultural-domestic facilities and the production base for increasing the capacities of the contracting organizations were built slightly ahead of the production construction.

The accumulated experience of the exemplary-exhibit construction is being generalized, analyzed and applied to the construction of other large industrial complexes. Minvostokstroy has made the decision to expand such construction. As of 1985 it will be organized in every territorial rayon of the Far East and the Transbaykal region.

The peculiar natural-climatic and engineering-geological conditions of this region not only complicate the organization of construction, but also have an influence on the design and technological decisions. There are still many complex, purely regional problems in foundation building, organizational and technological methods of conducting building operations, utilizing lightweight fillers, effective insulators, work mechanization, etc.

Together with the USSR Gosstroy, the ministry will solve the problem of utilizing lightweight metallic structures delivered in complement for construction in regions of the Pacific Ocean coastline and in zones with extremal temperatures and weather conditions. The questions of increasing the deliveries of foam polyurethane and polystyrene are being resolved in conjunction with the USSR Gosplan. The more intensive application of local raw material resources--the volcanic slag of Kamchatka and the Buryat ASSR, opoka from Sakhalin--is being planned for the future.

There are also reserves for increasing labor productivity in the application of a traditional material--brick. Together with the USSR Ministry of Building Materials, modernization of enterprises will be implemented for the purpose of manufacturing

vibration brick blocks and panels, enclosure and structural elements made of silicate concrete. It is necessary to strengthen the local building materials base and to develop enterprises for the manufacture of modern and effective materials, giving attention to the expanded production of cement, insulation and polymer materials, gypsum-cardboard sheets, and ceramic tiles.

Minvostokstroy has developed a long-term (to the year 2000) program of scientific research which is being realized in cooperation with over 20 scientific-research institutes of the USSR Gosstroy, USSR Academy of Sciences, and other ministries and departments.

The Basic Directions for Scientific-Technical Progress for 1985 and the 12th Five-Year Plan have been developed and ratified in July of 1984. These provide for the comprehensive improvement of all the ministry's activity.

In light of the party's requirements, all that we have done in the sphere of scientific-technical progress should be viewed as the beginning of extensive and intensive work on further increasing the technical level of building production and improving the indicators for the ministry's construction sites and enterprises.

Minvostokstroy has outlined an extensive program of intensification of construction and improving economic management. Under the conditions of the region, its implementation is associated with increased difficulties. At the same time, we must be ready for highly effective labor under any conditions. The words of CPSU Central Committee Secretary General K. U. Chernenko, who said that for this purpose "we must know not only how to set the right goals, but also how to stubbornly achieve them, overcoming any difficulties,"-- these must become our most important commandment.

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<sup>1</sup> K. U. Chernenko, "Narod i partiya yediny" [The People and the Party are One], Moscow, Politizdat, 1984, p 415.

CONSTRUCTION METHODS AND MATERIALS

QUALITY PROBLEMS WITH CEMENT, CONCRETE NOTED

Moscow EKONOMICHESKAYA GAZETA in Russian No 2, Jan 85 p 9

[Article by I. Karagod, chief of the USSR Gosstnab Department: "Use Cement More Efficiently; In the Interdepartmental Commission to Economize Resources"]

[Text] Capital construction is one of the most material consuming sectors of industry and the largest consumer of cement. Each percent that is saved or lost turns into an impressive figure for the national economy. Drop in at the construction sites. At some you can see building materials that are placed in an organized manner; at others there is dirt, debris and heaps of hardened concrete and mortar. And at those places where there is disorder they do not speak about economizing. An analysis that was conducted by the USSR Construction Bank showed that many construction organizations overconsume this valuable material.

Unnecessary cement waste begins with a deviation from the designs. For example, the management of SU-14 [Construction Administration 14] in the Main Novosibirsk Construction Trust No. 43 under the USSR Ministry of Construction (Yu. Illarionov, chief) decided to lay a concrete subbase instead of a sand and gravel subbase, which was not at all in short supply, during construction of the production building for DSK-1 [Housing Construction Combine 1] and as a result of this more than 400 cubic meters of concrete were consumed inefficiently. The chief of SU-1 in the Novosibirsk Housing Construction Trust, V. Kharenov, revised the technical documentation for a housing unit and replaced prefabricated partitions with brick ones. It is more comfortable that way. The state paid for the overconsumption with a whole boxcar of cement.

The well-adjusted system of operation and control requires that the specified grade of cement and mortar be used. But in certain organizations they prefer to simply increase the strength of the concrete by acting according to the proverb "You won't spoil the porridge with butter," where "butter" is overconsumed at someone else's expense. Evidently, the supervisors of Construction Administration No. 8 (V. Dmitriyev, chief) in the Main Western Construction Trust No. 31 under the USSR Ministry of Construction thought this way when they used a higher grade mortar--150--instead of grade 100, and grade 200 concrete instead of grade 150. This increased the consumption of cement by more than 400 tons.



Defective work costs the government dearly. Additional expenditures of labor and materials are required in order to correct it. In a number of cases cement is irretrievably lost due to the production of defective reinforced concrete products. ZhBI-11 [Reinforced Concrete Products 11] Plant (V. Makarov, director) in the Main Krasnodar Industrial Construction Administration under the USSR Ministry of Industrial Construction wasted 83 tons of cement to produce 317 cubic meters of defective products. Reinforced Concrete Products Plants No. 2 (V. Krasil'nikov, director) and No. 5 (V. Troshchin, director) in the Main Novosibirsk Construction Administration manufactured poor-quality panels. Construction workers had to use an additional half-boxcar full of cement in order to use them for building a housing unit and kindergarten at a chemical combine in Kuybyshev.

Plasticizer additives are not used sufficiently when producing concrete and mortar and yet this has important potential for economizing. During 1983, 44 percent of the concrete and mortar was manufactured with additives in the USSR Ministry of Industrial Construction and only a third in the USSR Ministry of Construction. And yet, the USSR Ministry of Construction, for example, could have obtained an additional 150,000 tons of concrete and mortar by using plasticizers. Explaining the reasons for the low level of using plasticizer additives, construction workers habitually cite the insufficient amount of superplasticizers allocated to them. It goes without saying, there are still insufficient amounts of superplasticizers. And the expansion of their output is being hindered to a certain degree by the same USSR Ministry of Industrial Construction that has not, up to now, begun construction of a plant to produce superplasticizers in Belorussia although the start of operations for it was specified to occur in 1985.

It is well known that cellulose production wastes--concentrates of sulfite and yeast byproducts--can be used as plasticizers. But only two-thirds of the wastes that are formed are being used at the present time including just three percent in all by construction workers as plasticizers. The byproducts that are thrown out in dumps take a substantial amount of space which poses additional ecological problems. Here is something that the construction ministries and also the USSR Ministry of the Timber, Pulp and Paper, and Wood Processing Industry should think about. Cellulose and paper combines must consider the wishes of construction workers as to the content of waste products and also increase the output of them in the form of a powder which simplifies its transportation and use.

I would especially like to talk about the quite extensive phenomenon of the unlawful output of cement that does not become part of the available supply. Construction workers constantly refer to the lack of cement. Requests are usually received from them for an increase in the supply by the last quarter. But then how can you explain the generous "gifts" of cements and products made from it that are presented to other enterprises and organizations? For when there are few materials it would not cross anyone's mind to give them away as a gift or exchange them. Yet the USSR Ministry of Construction unlawfully supplied non-affiliated organizations with about 33,000 tons of cement and the USSR Ministry of Industrial Construction more than 22,000 tons of cement during the first half of the year.

A serious discussion was held concerning all of this at a meeting of the interdepartmental commission for economizing and efficiently using material resources where the problem of using cement in the USSR Ministry of Construction and the USSR Ministry of Industrial Construction was examined.

These ministries have not fallen within the planned norm for the consumption of cement that was established by USSR Gosplan for a number of years; in this regard from January to June of last year alone the USSR Ministry of Construction overconsumed more than 300,000 tons of cement and the USSR Ministry of Industrial Construction about 400,000 tons.

In the USSR Ministry of Construction's system the greatest losses were permitted in the Main Ivanovo Construction Administration--26 percent, the Turkmen SSR Ministry of Construction--24 percent, and the Tajik SSR Ministry of Construction--22 percent.

The interdepartmental commission recommended that the USSR Ministry of Industrial Construction and the USSR Ministry of Construction work out and implement additional measures to eliminate losses of cement, expand the use of ash and TES [thermal electric power station] slag, and plasticizer additives, more actively disseminate the expertise of the most advanced construction organizations in efficiently using material resources, and to make responsible individuals liable who permit cement to be squandered.

Based on the instructions of the interdepartmental commission USSR Gosstab reduced the available yearly supply of cement for the USSR Ministry of Construction and the USSR Ministry of Industrial Construction by the amounts that were unlawfully given to non-affiliated organizations. Fines were exacted from the construction organizations for production that did not become part of the available supply.

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CONSTRUCTION METHODS AND MATERIALS

QUAKE RESISTANT, LARGE PANEL HOUSES UNDER DEVELOPMENT

Tashkent PRAVDA VOSTOKA in Russian 8 Jan 85 p 3

[Article by R. Ismaylov, candidate in technical sciences: "Nine-Story Building Withstands Test of Two Earthquakes"]

[Text] There is an earthquake... The nine-story panel house begins to sway slowly. The jolts increase, and the force of the earthquake is close to computed value. The building is in this state for about one minute--it is rare to have an earthquake of such intensity for such duration. In about two hours there is another jolt...

To the praise of builders and designers, the building withstood not only these two earthquakes, but also a subsequent one which occurred within two days.

The earthquake was man-made. It was created by the colleagues at the Sectorial Laboratory on Structural Strength and Seismic Resistance of the Building Mechanics and Structural Seismic Resistance Department in conjunction with the instructors of the Electric Drive Department of Tashkent Polytechnical Institute. Quite recently the collective successfully performed testing of a multi-story metallic frame structure for the main unit of the Novoangrenskiy GRES [State Regional Electric Power Station].

In performing such experiments, it is important not only to shake the building, but also to properly place the instruments, obtain recordings of the oscillations, process them, and perform an analysis of the recording and an engineering analysis of the structure's behavior. Doctor of Technical Sciences, Professor K. S. Abdurashidov, who is chairman of the Department of Building Mechanics and Structural Seismic Resistance at TashPI, is in charge of all these operations.

The experiments were necessary, since the new master plan for Tashkent provides for a significant increase in the number of multi-story buildings within the city's development. To resolve this problem, the zonal Scientific-Research and Project Design Institute for Standard and Experimental Design of Residential and Public Buildings in Tashkent (TashZNIIEP) performed work on the application of the existing base of house building combines for building large-panel houses of increased story height.

Within the framework of development and introduction of the first stage of the Unified Catalog of Industrial Products for Large-Panel Residential Houses and

Public Buildings for Tashkent, the design-planning scheme of series TLSK-71P/77 houses was corrected. This series of houses has improved planning of apartments, reinforced panel joint connections, and additional measures for ensuring seismic resistance. The first eight-story house was built in 1983. Construction is currently being completed on several nine-story houses of this series.

The scientific research which has been performed, as well as the application of rational design methods has made it possible to significantly reduce the estimated cost, metal consumption and labor consumption in the series TLSK-71P/77 nine-story houses as compared with the series GT-SP nine-story houses which were being built in Tashkent. The main thing is that it has become possible to go from the construction of four- and five-story houses to the construction of nine-story houses without stopping production. This is extremely important for the capital city, which is experiencing a shortage of urban territory.

The experimental studies have great significance for improving the quality of construction and for seeking reserves in economy in all sectors of construction--from planning and design to construction and operation. Up until recently, the traditional basic methods of experimental research on building designs, including designs of large-panel buildings, were the laboratory tests of units, individual elements, and fragments of buildings. The testing of buildings for seismic resistance under natural conditions with the aid of a vibration machine makes it possible to evaluate their reliability with sufficient accuracy.

The last tests showed that the houses of this series which have been built will successfully withstand earthquakes of computed intensity. The economic effect from the possibility of building multi-story buildings without changing the technology of panel production at the house building combines is several million rubles.

12322  
CSO: 1821/054



CONSTRUCTION METHODS AND MATERIALS

NON-DESTRUCTIVE TESTING OF STEEL STRUCTURES DEVELOPED

Moscow VECHERNAYA MOSKVA in Russian 22 Dec 84 p 1

[Article by M. Belostotskaya: "Sound--The Diagnostician"]

[Text] Interesting research work is currently being performed at the "Serp i Molot" Metallurgical Plant.

VECHERNAYA MOSKVA has already reported to readers that the country's first laboratory for diagnostics of bridge structures, overpasses and underground communications has been created at the Mosgorispolkom Roads Administration. This laboratory utilizes the method developed by scientists at the Metallurgy Institute imeni A. A. Baykov.

The method of operative acoustic-emission diagnostics makes it possible to register inaudible sound oscillations emitted by microscopic cracks in metallic structures with the aid of special apparatus. This method makes it possible to prevent disintegration and to eliminate potentially dangerous defects in time. The new method has already been used to test many Moscow bridges.

And now the method of operative diagnostics has received yet another profession--that of metallurgist. Two specially equipped laboratory machines have appeared today in the empty thermocalibration shop at the Serp i Molot Plant. The spanner elements of the shop and the metallurgical equipment which had served for many years were thoroughly "sounded" and studied with the aid of gauges. An on-site computer processed the obtained data, which made it possible to give recommendations to the production specialists. The entire work volume was performed in a single day. This is the advantage of the operative diagnostics method, whose productivity is 1,000 times higher than the standard classical method.

In the near future, institute scientists and laboratory colleagues will continue their research at metallurgical enterprises. A program of work has been compiled for control of finished production at the Elektrostal' Electrometallurgical Plant imeni I. Tevosyan, and at metallurgical enterprises in Novolipetsk, Nizhniy Tagil, Cherepovets, and Tula. The testing of bridges and underground collectors will be continued in Moscow.

12322  
CSO: 1821/054

ARTILLERY USED FOR FOUNDATION WORK IN WINTER

Moscow KRASNAYA ZVEZDA in Russian 20 Jan 85 p 4

[Article by A. Gil'ts, ZVEZDA oblast newspaper correspondent: "Cannons Shoot... Anchor Ties"]

[Text] Successful experiments have been conducted in Perm on the application of outdated artillery systems in the national economy.

How does one install a drilling rig so that it will stand firmly, reliably, and with absolute stability? Installers secure it with steel bracing cables. This work is rather labor consumptive: with the aid of an assembly operating on the principle of an ice borer, eight anchor bolts are screwed into the ground to a depth of 2-3 meters and the bracing cables are secured to them. This is alright if it is summer and the ground is soft. But what if it is winter, and permafrost?

Perm specialists solved this complex technical problem in an original manner, calling to their aid...artillery. They secured the barrel and breech of an old cannon which had served its time to a TT-4 hauling tractor. An ordinary 5-meter pipe serves as the anchor. The barrel is placed in a horizontal position, the pipe is "loaded" into it, and a cartridge with powder charge is placed into the breech. It is fired--and the pipe is driven firmly and exactly into the desired place.

The idea of "teaching" the cannon a strictly peaceful profession belongs to the Perm inventors M. Tsirol'nikov and Ye. Romanov. The specialists at Minnefteprom [Ministry of the Petroleum Industry] and Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] became interested in their proposal. Provision has already been made to manufacture up to 100 such installations in the 12th Five-Year Plan.

The sphere of application of these new units is rather extensive: the installation of foundations (with simultaneous compaction of the soil) for different buildings, the construction of LEP [electrical transmission lines], the equipment of petroleum deposits, and the laying of gas and oil lines in boggy terrain. The UZAS-2 installation (this is the name of this machine) will be of inestimable aid in geophysical studies and in the construction of artesian

wells. Computations performed by specialists show that the application of only 20 UZAS-2 installations yields an annual economic effect of 360,000 rubles.

Today the designers of the Perm'neft' Association under the management of M. Tsurul'nikov are preparing for the industrial application of the installations. In the next 2 years the first 5 installations will begin work in the oil and gas extraction administrations of Prikamiye.

Parallel with this work, a collective at the recently created Perm integrated design section at the Gazstroy Mashina Special Design Bureau within the Min-neftegazstroy has tested a ballistic installation for trenchless pipe laying.

I had the opportunity of being present at these tests. The water line route was to cross a railroad bed. About 10 days are required to "push" a pipe casing under a 30-meter wide railroad bed using the standard method, with the aid of hydraulic jacks. The "artillerymen" builders completed the work by evening. The operation took only 2 days (one of them was spent for installation of the foundation pit). Also, traffic along the railroad branch was not halted during the testing.

At present the specialists at the Gazstroy Mashina Special Design Bureau are working out a variant which would make it possible to "pierce" the ground with large diameter pipes for gas mains.

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